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STEEL

ESTABLISHED 1882

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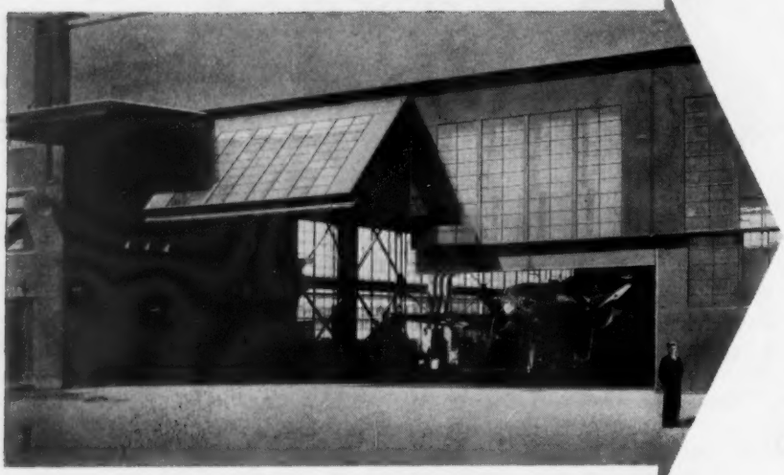
PRODUCTION • PROCESSING • DISTRIBUTION • USE

1. DEPENDABLE
2. EFFICIENT
3. ECONOMICAL

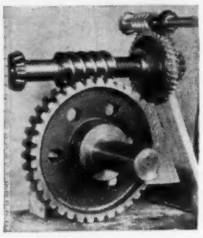
. . . these alloys of

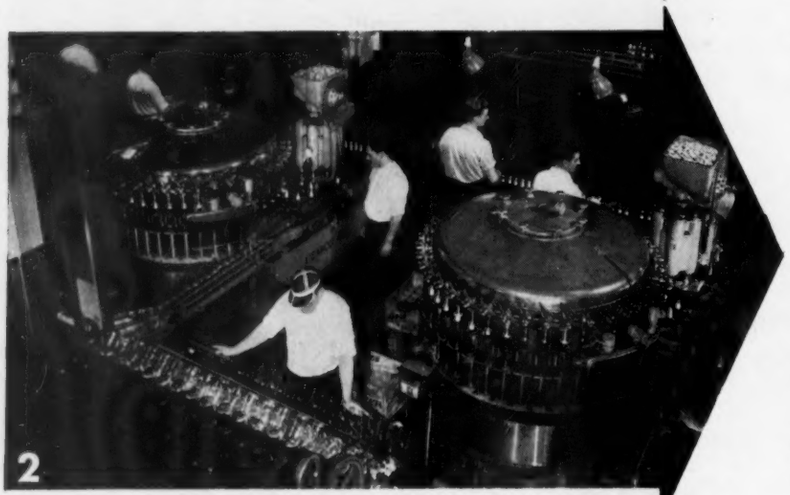
NICKEL



1. *HANGAR MAINTENANCE:*

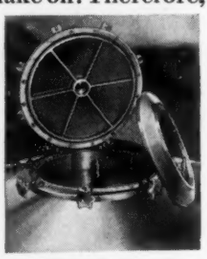
The Dominion's largest doors, on Trans-Canada Airway's new hangars, are opened and closed by Nickel steel worms and chill-cast Nickel bronze gears. To obtain tensile strength of 51,000 p.s.i. the Richards-Wilcox Canadian Co., Ltd., London, Ontario, Canada, specified these gears cast with this composition: copper, 87.50%; tin, 11.00%; Nickel, 1.50%. The addition of Nickel to bronze improves density and strength without impairing anti-frictional qualities of gear surfaces — assures long trouble-free service life.

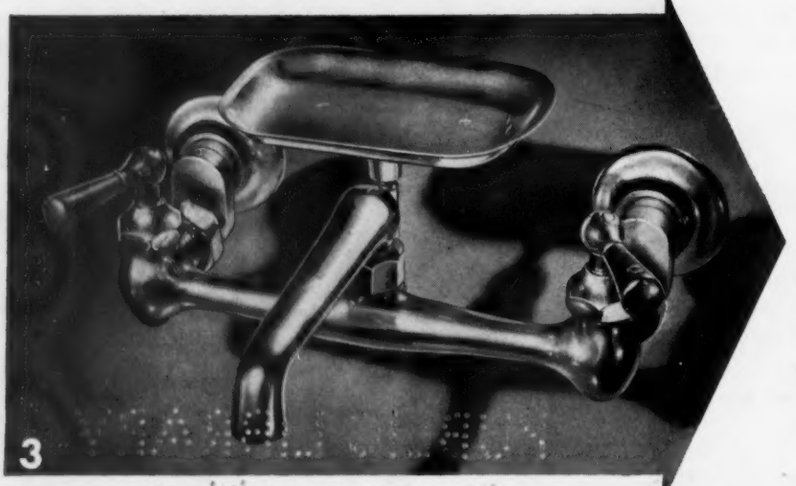




2. *BOTTLING OPERATIONS:*

Metals used in bottling equipment must be corrosion resistant, strong, bright and attractive and be able to withstand repeated cleaning operations. Above all they must be non-contaminating to safeguard the beverages with which they come in contact. Solid Nickel Silver possesses these improved properties. Combining good structural qualities with resistance to corrosives, and eye appeal, it can be readily and repeatedly cleaned because there are no platings or coatings to wear away or flake off. Therefore, the Crown Cork and Seal Co., Baltimore, uses Solid Nickel Silvers for many parts of their high speed bottling and capping machines which come in contact with the beverages.





3. *FOUNDRY PRACTICE:*

Shrinks and cracks forced remelting of one of every four swing spout fixtures! That was the unprofitable record of the Universal Brass Manufacturing Co., Los Angeles. Rejects ate the heart out of profits. By adding 1% Nickel grain structures were refined making castings so pressure-tight and sound, that 90% of rejects were avoided. The uniformity of Nickel-bronzes cuts machining costs, too. Consultation is invited on money-saving applications of Nickel alloyed materials.

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL ST., NEW YORK, N. Y.

STEEL
PRODUCTION • PROCESSING • DISTRIBUTION • USE

As the Editor Views the News

■ FOURTH quarter output by the steel industry appears likely to set an all-time record. Ingot output (p. 18) rose last week 4½ points, to 84 per cent of capacity, and the industry strains in its effort to place long idle facilities in production, to eliminate bottlenecks. Consumers who are nervous over uncertain cost trends are anxious to know what prices will apply to first quarter steel shipments, and there are (p. 69) indications that leading mills shortly will announce prices they will charge during that period. It is difficult (p. 15) to estimate costs in the near future because of advancing raw materials, also because there may develop a demand for higher wages. Already some mills have marked up price by $2 to $5 a ton due to higher pig iron and scrap prices.

• • •

The unprecedented wave of steel buying (p. 69) seems to have passed its crest, particularly because the huge volume of steel shipments is enabling consumers to build up comfortable inventories. On the other hand, consumption is increasing. This is notably so in the automobile industry. Railroad buying of all kinds reflects the sharpest increase in many years. Shipbuilding will gain impressively through placing of 49 additional cargo vessels in September. Demand for airplanes (p. 29) is soaring to new levels. The trend is reflected by the fact that machine tool orders in first half of September (p. 17) was double the entire August total . . . Republic Steel Corp. (p. 20) announces a $3,000,000 expansion program . . . The war resources board (p. 17) is to be disbanded when it completes its report.

Crest Is Past

• • •

As congress (p. 26) prepares to debate our future neutrality policy, industrial leaders (p. 22) declare their hatred of war and are anxious that this country will not go to war . . . Due to uncertainties caused by the war, Walter S. Tower, executive secretary, American Iron and Steel institute, recommends indefinite postponement (p. 19) of negotiations for reviving the trade agreement with Belgium . . . Unlike 25 years ago, there is little present alarm (p. 23) over available tungsten supplies . . . General Motors' new pricing plan, drafted in co-operation with the federal trade commission, is aimed (p. 32) at avoiding all criticisms by consumer groups or government agencies . . . House committee investigating the labor board (p. 28) has sent out 60,000 questionnaires to employers and labor organizations.

Industry Hates War

• • •

Stainless clad steel has been used increasingly in fabricating much processing equipment subject to corrosive attack. A new multi-layer cladding process (p. 42) utilizes resistance welding for placing such protective coatings on low-carbon plates. The stainless cladding is in two thin sheets; these are screened from the base metal by a sheet of pure nickel 0.01-inch thick which prevents migration of carbon from the base metal to the stainless steel. The product is used successfully in equipment for the oil and chemical industries which are operated at high temperatures and under high pressures. . . . Problem of handling and loading heavy sheet packs has been solved at one steel plant (p. 53) by installation of a fork truck which lifts 12,000-pound packs 58 inches and is extremely flexible.

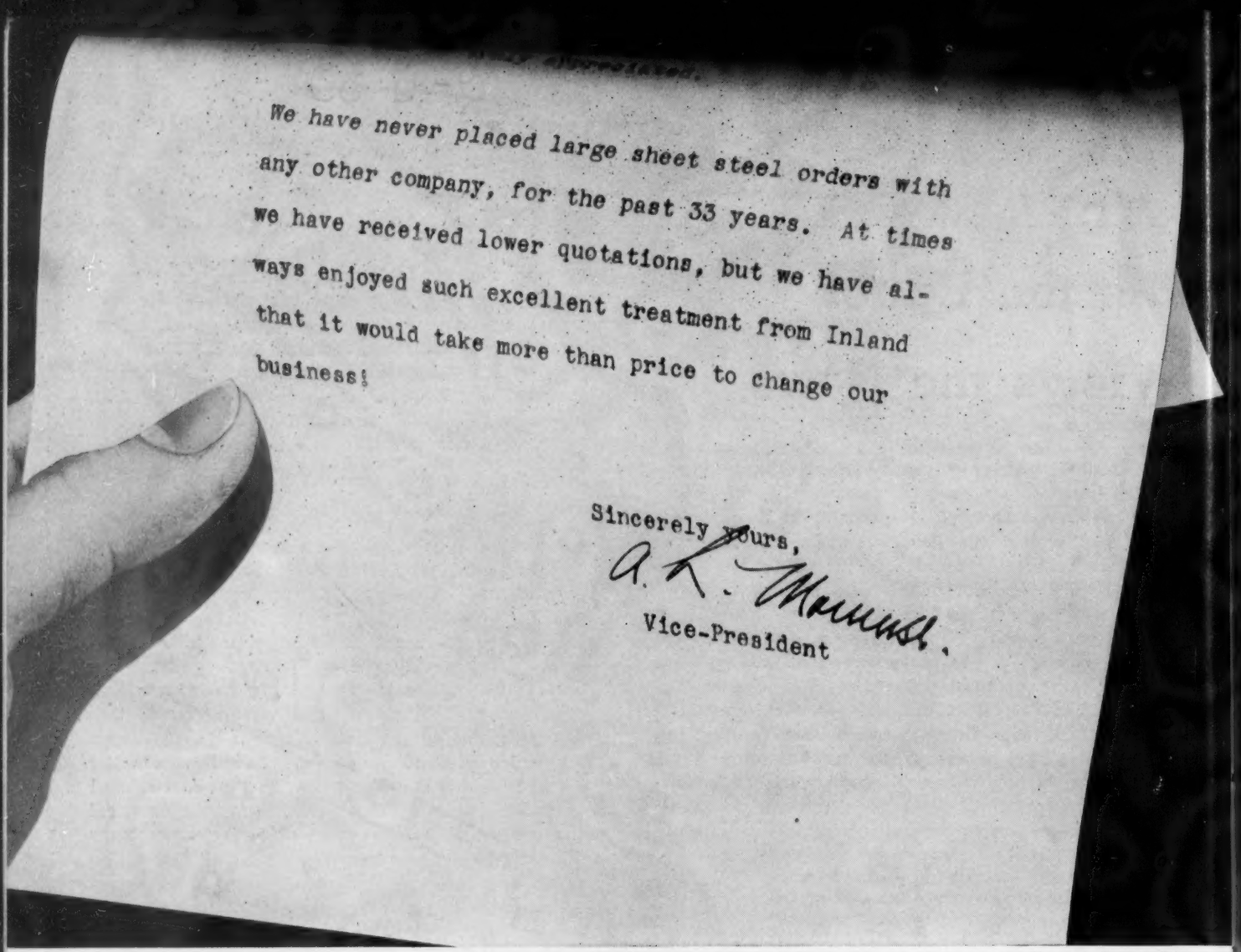
Steel Clad In Nickel

• • •

Attendants at last week's annual meeting of the Association of Iron and Steel Engineers learned (p. 49) that stainless steel sheets up to 30 inches wide now are being produced in this country in a mill consisting of one stand of 20 rolls which effects a reduction in 1.00 per cent carbon grade ranging from 80 to 90 per cent in three passes without an anneal. Flame scarfing was revealed as a low-cost and efficient method for cleaning semifinished steel. Also brought out was the fact that open hearth steel production may be increased 5 to 15 per cent through furnace modernization at little or no cost. . . . A new open-flame principle (p. 44) is revolutionizing the annealing of nonferrous wire. . . . Laying cages for poultry (p. 64) offer a rapidly growing outlet for galvanized steel.

Flame Cleaner

E C Kreutzberg


We have never placed large sheet steel orders with any other company, for the past 33 years. At times we have received lower quotations, but we have always enjoyed such excellent treatment from Inland that it would take more than price to change our business!
Sincerely yours,
Vice-President

Letter on file at Inland offices

Loyal to Inland for 33 years
despite lower prices

This excerpt from a letter recently received from an Inland customer typifies the attitude among many steel users who know Inland quality and Inland service.

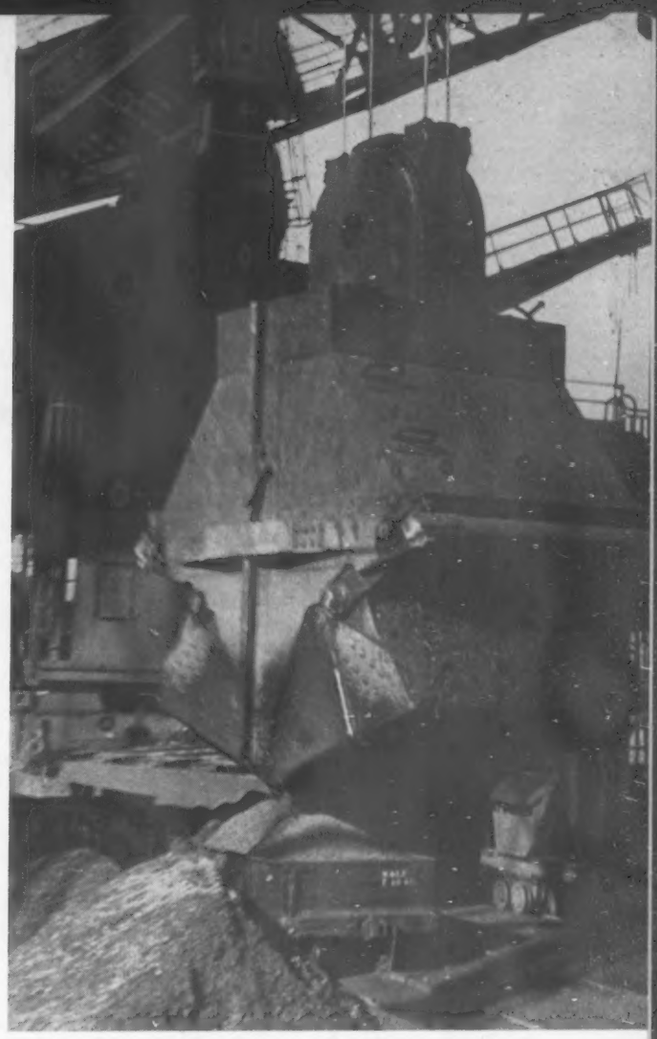
Using that quality and that service might well lead to important economies in your business.

INLAND STEEL CO.

38 S. Dearborn St., CHICAGO • District Offices: MILWAUKEE • DETROIT • ST. PAUL • ST. LOUIS • KANSAS CITY • CINCINNATI

SHEETS STRIP TIN PLATE BARS PLATES FLOOR PLATES STRUCTURALS PILING RAILS TRACK ACCESSORIES REINFORCING BARS

Raw Materials Lead In Price Advance; Mills Busier



■ Unloading borings and turnings from ship at a Great Lakes port. This grade of scrap, used in blast furnaces, advanced $2.25 a ton from $9.50 Sept. 2 to $11.75, Sept. 30, at Pittsburgh. In the same period the steelworks scrap composite price rose $5.25 from $15.50 to $20.75

■ RAW MATERIALS currently occupy the center of the industrial stage. With a somewhat calmer tone pervading the iron and steel market, skyrocketing scrap prices are causing producers to count their costs more closely.

Several eastern plate and sheet producers have advanced prices of their products $5 a ton to compensate for added costs imposed by rising quotations for scrap. Rail steel bar producers advanced prices $2 to $3 a ton for the same reason.

Meanwhile, steel mills attacked huge backlogs and placed practically all available facilities in service. National steelworks operating rate moved up 4½ points to 84 per cent of capacity. Time required to recondition idle open hearths and blast furnaces has delayed more rapid advance in operations.

Last week more workers were called back as additional units resumed. In some instances these are the less efficient units which are placed in service only in periods of exceedingly heavy demand.

A majority of steel buyers have completed coverage for current quarter's requirements, although some inquiries still are appearing. Pressure for deliveries is strong.

Quarter May Set Output Record

Heavy engagement of steelmaking capacity as result of orders already placed gives the industry prospects for attaining the largest quarterly ingot production in history during the ensuing three months. Present record was established in the second quarter of 1929, with an output of 15,139,254 gross tons. Average operations of slightly less than 85 per cent of capacity over the remainder of the year will cause production to exceed this figure. Pig iron shipments may set a new fourth quarter record.

That first quarter finished steel prices may be announced soon appears probable. Steel buyers, particularly fabricators who are bidding on business that will not be completed until next year, find it difficult to estimate future costs so long as they must buy steel regulated by quotations in effect at time of shipment, and are seeking clarification of future prices.

Producers encounter the same difficulty in attempting to determine costs three to six months hence.

Scrap Cost Is Large Factor

A major factor in the problem is the future cost of raw materials. Scrap prices have advanced sharply in the past month, STEEL'S composite moving up from $15.50 to $20.75, an increase of more than 33 per cent. Coal and coke shortage is causing prices of these products to edge upward. Labor unions' demands for wage increases in other fields foreshadow possibility of similar demands in the steel industry.

Influence of scrap on producers' total costs is evidenced by the fact it represents approximately one-half the raw materials charged into the open hearth. On the average one-half the scrap consumed is "home" scrap—produced by the mill in the course of its various operations—and the remainder is purchased scrap. This means mills must pay 33 per cent more today than a month ago for one-fourth of the raw materials that go into the open hearth.

To arrest this rising cost, a larger proportion of pig iron and less scrap in the melt may be resorted to by producers operating their own blast furnaces. The same is true of the foundry. Some mills have scrap due them against contracts placed before the rise in prices; others have supplies on hand that pre-

vent their scrap costs from immediately reflecting the full advance of the past four weeks.

Smaller, nonintegrated mills and foundries, which do not have their own blast furnaces and other sources of raw materials, must depend more largely on scrap. Plight of these companies was expressed last week by Robert W. Wolcott, president, Lukens Steel Co., Coatesville, Pa., in announcing a $5 increase in its prices.

Said Mr. Wolcott: "Unlike the large, integrated steel companies, steel concerns like Lukens as well as thousands of foundries throughout the country do not own or control their own iron mines, blast furnaces and other sources of raw materials, and are therefore wholly dependent on scrap. Nonintegrated steel companies and foundries are completely at the mercy of the present hysterical market in scrap, brought about largely by abnormal exportation in recent years.

"Our present stock of scrap will soon be consumed in filling orders on hand and present commitments for our customers. We are now faced with the necessity of replacing our stock of scrap at prices from $7 to $10 per ton higher than a month ago. Other essntial raw material replacements must also be made at somewhat higher prices.

Prices at 1937 Level

"Hence, we have no recourse but to increase our steel prices, effective immediately, by $5 per ton. Although this increase does not entirely adjust for the higher price of scrap, the higher rate of operations now prevailing is expected to offset the difference.

"With this increase of $5 per ton, the price of steel plates at Coatesville is no higher than in 1937, when scrap prices were lower than at present."

The Lukens statement pointed out that more than 15,000,000 gross tons of scrap have been exported from this country since January, 1934, blamed this for present relative scarcity of scrap and increase in prices.

Steel producers met in New York last week to canvass the situation in raw materials, particularly scrap. Representatives of the scrap industry were present at one session and stabilization of the scrap market was studied. No definite steps were announced.

Meanwhile, indications were that scrap exports will fall off sharply in September and virtually cease if the war continues. August figures, just announced, show exports started to decline in that month. August exports were only 291,896 gross tons, compared with 350,066 tons in July. August, 1938, exports were 108,013 tons.

Freight and insurance costs have risen exorbitantly and foreign buyers have been unable to supply ships. Another factor which will decrease exports is the increase in domestic demand and prices.

Scrap trade interests base their prediction exports will decline sharply on the fact many contracts signed with European customers are about to expire and will not be renewed unless prices are brought in line with domestic levels.

August statistics of the commerce department show Japan continued as the leading buyer with 131,484 tons, against 122,273 tons in July. United Kingdom took only 79,659 tons, compared with 99,833 in July, although there was every indication of an imminent outbreak of hostilities. Italy took 23,103 tons, against 50,170 in July; Poland, 30,237 tons in August, and 37,044 tons in July. Scrap exports for eight months this year totaled 2,430,914 tons, compared with 2,032,749 tons in the period last year.

Scrap Consumption, Exports, Imports

Gross tons

	Domestic consumption	Exports	Imports	Steel ingot production
1929	37,600,000	557,044	90,479	56,443,473
1930	26,600,000	358,649	27,482	40,699,483
1931	18,300,000	136,125	16,279	25,945,501
1932	10,000,000	227,522	9,775	13,681,162
1933	17,400,000	773,406	56,133	23,232,347
1934	18,800,000	1,835,170	44,421	26,055,289
1935	26,415,330	2,103,959	64,768	34,092,594
1936	36,358,133	1,936,132	142,245	47,767,856
1937	38,006,272	4,092,590	81,640	50,568,701
1938	21,000,000	3,003,523	24,451	28,349,991
1939 (8 mos.)	19,920,000	2,429,454	*18,138	25,556,179
January	9,739,000	227,844	3,333	3,174,352
February		224,913	1,413	2,988,649
March		312,262	780	3,405,370
April		240,124	2,769	2,974,246
May	2,263,000	384,881	3,971	2,922,875
June	2,428,000	398,888	2,537	3,125,288
July	2,551,000	350,066	3,335	3,162,534
August	2,919,000	291,896	.....	3,763,718

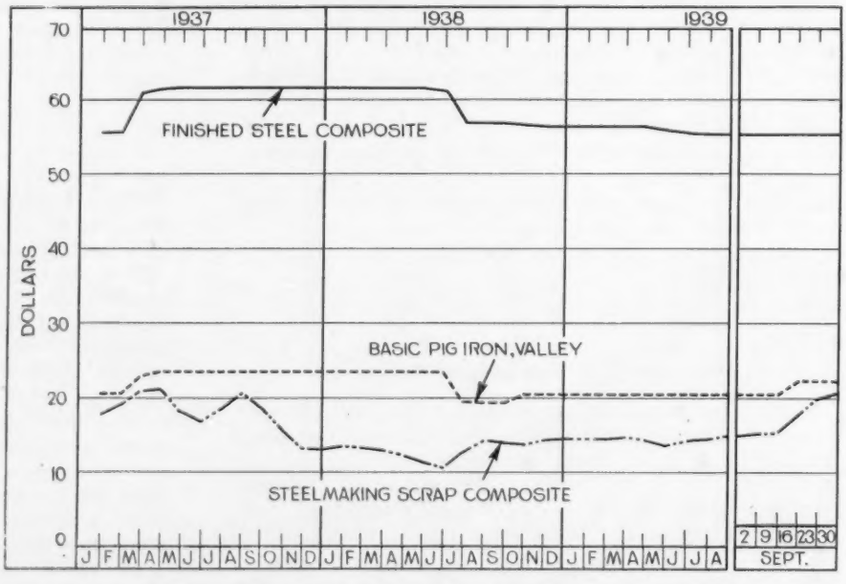
*Seven months.

CANADA BANS EXPORTS OF SCRAP IRON AND STEEL

Exports of scrap iron and steel were embargoed last week by Canada. Other scrap metals may be exported only under special license.

Ban was ordered under a customs act section governing war materials exports. All cars which had been fully or partially loaded when the

Trend of Finished Steel, Basic Iron, Scrap Prices



■ **Monthly average prices of finished steel and pig iron since the beginning of 1937 show relative steadiness compared with frequent variations in steelmaking scrap. Effect of increased steel production on scrap demand is reflected in the rapid rise in the latter during September**

embargo was declared were cleared.

Special licenses now are necessary in exporting Canadian metals such as nickel, blister copper, lead and zinc, with shipper naming the consignee and stating purpose for which the material is to be used.

Canadian iron and steel scrap exports to the United States, in gross tons:

1936	132,466
1937	76,512
1938	23,680
1939 (6 mos.)	14,506

49 Merchant Ships Placed in Month; Heavy Steel Tonnages for Railroads

Orders and protections for ship steel increased sharply in September. Awards totaled 49 merchant ships, requiring 178,200 tons of steel. This brought awards through the maritime commission so far this year to 77 vessels, requiring 291,000 tons of steel. In addition, eight more ships, taking 36,800 tons, are pending, bids having been opened about a fortnight ago.

Last month's orders were divided as follows: 22 to Bethlehem Steel Co.; 4 to Ingalls Shipbuilding Corp., Birmingham, Ala.; 1 to Newport News Shipbuilding & Dry Dock Co., Newport News, Va.; 5 to Seattle-Tacoma Shipbuilding Co., Seattle; 8 to the Sun Shipbuilding & Dry Dock Co., Chester, Pa.; 4 to Tampa Shipbuilding & Engineering Co., Tampa, Fla.; and 5 to Western Pipe & Steel Co., San Francisco.

The September spurt in freight car buying brought the month's awards close to double the total for all of the preceding months this year. Orders through August amounted to 12,456 cars. Last month's business raised bookings for the year to date to 35,000 or more units. This compares with 16,303 in all of 1938, 51,611 in all of 1937 and 64,223 in all 1936.

Recent buying compares favorably with the most active months of the past ten years and results from the lack of a sufficient supply of surplus cars in the face of rising freight traffic.

Purchases of rails and track fastenings also increased markedly in September. While track material buying in anticipation of the following year's needs ordinarily is light until fourth quarter, the month's rail orders totaled approximately 280,000 tons, in addition to a large tonnage of fastenings. Pending business will swell this figure further in October.

Freight cars placed recently and those still pending, for which protection on steel has been sought, involved approximately 500,000 tons of steel products. In addition, more than 100,000 tons of steel is under protection for equipment repairs.

Machine Tool Orders September 1-15 Double August's; Price Levels Hold

Domestic machine tool orders for the first half of September were double the total for the entire month of August, according to an industry-wide survey just completed by the National Machine Tool Builders' association, Cleveland. Foreign orders during this period likewise showed a substantial increase.

"Domestic orders," Wendell E. Whipp, association president, said, "are coming in from a wide variety of machine tool using industries, and apparently are reflecting, for the most part, the expectation of increased production for fulfilling the normal peace-time needs of the country. While a share of the increased domestic business, such as that coming from the aircraft industries, shipbuilding and the government, is founded upon considerations of national defense, the major portion has come from such widely diversified fields of manufacture as the construction industries, the railroads, textile and food machinery, electrical appliances, automotive equipment, office equipment and many others which have no direct relation to the war situation.

"In spite of the sudden increase in demand, there has been no general increase in the prices of machine tools. In certain cases, particularly with respect to foreign orders, some prices have been advanced. It is my belief, however, that machine tool builders generally are making every effort to retain present price levels and that such price increases as may materialize will be limited to those made absolutely necessary by increased production costs.

FABRICATORS RAISE PRICES MODERATELY, IF AT ALL

While manufacturers of fabricated metal products are nervous about their cost trends, they are showing a fairly general disposition to advance their selling prices moderately, if at all.

The case of a woman in Detroit whose dealer explained that the price of a stainless steel cooking utensil had been marked up from $3.50 to $4.25 "because of the advance in the price of steel" seems to be a marked exception to the general rule.

In the field of household goods, manufacturers' prices on copper boilers have been advanced some 10 per cent and other copper and brass goods are up similarly. One maker of galvanized steel garbage cans has announced an advance of 10 per cent, but seems to be the only one so far to make such a change. A manufacturer of galvanized steel ash cans moved its prices up 5 per cent on Sept. 23. A manufacturer of steel kitchen cabinets, a maker of steel fireplace equipment and several makers of enameled kitchenware have advised their customers that they cannot guarantee continuance of present prices and suggest dealers stock up before prices advance.

In the mill supply field manufacturers' price advances have been confined to valves and fittings, up 5 to 10 per cent, and leather belting, up 5 per cent. There is uneasiness in regard to high speed tool steel and tungsten carbide cutting tools since it is expected that it is only a matter of time before advances in the price of ferrotungsten will bring an increase in prices on these products. No increases have been made on wrenches, chisels, files and many other fabricated steel items; in fact, several manufacturers have advised their customers they have no advances in immediate prospect.

WAR RESOURCES BOARD WILL BE DISBANDED

War resources board is to be disbanded when it makes its report in the next ten days or two weeks, President Roosevelt disclosed last week.

Announcement came as a surprise. At the time the board, headed by Edward R. Stettinius Jr., chairman, United States Steel Corp., was organized, it was said the board would be a continuing body. It was set up to study and co-ordinate the industrial mobilization plan.

Just what is the reason for the

sudden termination of the board no one seems to know.

The President said at his press conference last Friday that he does not believe the board's report will be made public when it is completed. He stated it will deal with industrial expansion, chances of stepping up industrial production, additional power facilities, and the relation of industry to agriculture in the event of the United States getting into war.

J. & L. RESTORES FULL TIME SCHEDULES, PAY

Jones & Laughlin Steel Corp. announced last week that effective Oct. 1 most of its salaried employes will be restored to a full time schedule and full pay, from the reduced schedules and pay in effect since Feb. 1, 1938. The change was necessary due to extra work on the increased volume of business.

Bar Mill Wages Steady

■ Wages of puddlers and bar mill employes of companies affiliated with the Western Bar Iron association and the Amalgamated Association of Iron, Steel and Tin Workers, will be unchanged during October, according to the monthly settlement last week.

For the fourth successive month, the card rate on boiling, or puddling, bar and 12-inch mills was reported as 2.15c; and on guide and 10-inch mills, 2.25c.

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended Sept. 30	Change	Same week 1938	Same week 1937
Pittsburgh	79	+ 4	37	71
Chicago	84	+ 5.5	41.5	75.5
Eastern Pa.	61	+ 2	32	60
Youngstown	86	+ 4	49	65
Wheeling	88	None	54	82
Cleveland	87.5	+ 3.5	48.5	67
Buffalo	72	None	51	74
Birmingham	86	+ 3	57	83
New England	100	+20	65	65
Cincinnati	78.5	+ 7	43	89
St. Louis	72	+ 5.5	48.5	64
Detroit	99	None	72	100
Average	84	+ 4.5	47	74

PRODUCTION

■ STEELWORKS operations last week advanced 4.5 points to 84 per cent, highest since August, 1937. Nine districts advanced and three were steady. Last year the rate was 47 per cent; two years ago, 74 per cent.

Youngstown, O. — Rose 4 points to 86 per cent, due mainly to increased bessemer output. Schedule for this week is for 89 per cent, three open hearths to be added. Active open hearths last week numbered 68. Two blast furnaces have been blown in and another will be added this week, four others being reconditioned.

Chicago—Advanced 5.5 points to 84 per cent, two mills having all open hearths in production.

St. Louis—Lighting of an additional open hearth raised the rate 5.5 points to 72 per cent, highest since September, 1937.

Birmingham, Ala.—Up 3 points to 86 per cent, with 20 open hearths in production.

Central eastern seaboard — Increased 2 points to 61 per cent, this week's schedule indicating a further advance.

Detroit—Unchanged at 99 per cent, virtual capacity.

Buffalo — Steady at 72 per cent with one or more furnaces to be lighted this week.

New England — Gained 20 points to 100 per cent, every open hearth in the district being in service.

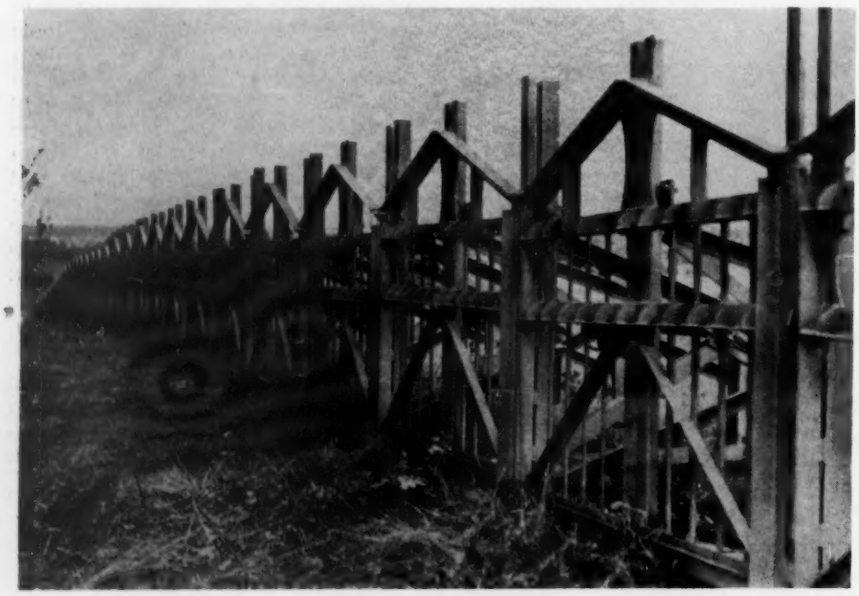
Pittsburgh—Up 4 points to 79 per cent. Further rise is indicated for this week.

Wheeling—Held at 88 per cent.

Cleveland—Rose 3.5 points to 87.5 per cent. This is considered practical capacity for available steelmaking units.

Cincinnati—Increased 7 points to 78.5 per cent. Another increase is indicated this week.

Steel Safeguards Belgium's Neutrality



■ **Although her neutrality has been guaranteed by Great Britain, France and Germany, Belgium has strengthened her border defenses with many miles of fence made of structural members, braced solidly, especially designed to stop tanks. Picture passed by the censor. NEA photo**

Summon Steelmen to TNEC Hearing Oct. 16

WASHINGTON

■ Department of justice late last week sent letters to 25 to 30 steelmen asking them to appear at hearings to be held by the temporary national economic committee beginning Oct. 16. Names were not disclosed. The steel companies to be represented were divided into three groups, large, small, medium. Letters also were sent to the companies for whom the individuals work asking that they be allowed to come to Washington to testify.

Britain's Largest Blast Furnace Completed

■ Great Britain's largest blast furnace, capacity 3500 tons per week, has been blown in by Appleby-Frodingham Steel Co., Scunthorpe, Lincolnshire. A second furnace of similar design is to be erected. The stacks are 200 feet high. These furnaces are the principal part of a £3,000,000 extension begun two years ago. A large battery of coke ovens is under construction.

The company now has nine blast furnace stacks in operation, smelting local low-grade ironstone ores.

Institute Opposes Tariff Cuts; "No Reason for Importing Steel"

WASHINGTON

■ INDEFINITE postponement of negotiations for revising our trade agreement with Belgium, in view of uncertainties caused by the war, is recommended by Walter S. Tower, executive secretary, American Iron and Steel institute, in a statement to the committee for reciprocity information.

Mr. Tower urges no further concessions on iron and steel products be granted if it finally is decided to proceed with proposed pact revision. His statement points out there is no economic necessity or reason for importing iron and steel from any country as domestic capacity is ample.

Serious handicap to the American industry, already suffering from low earnings, would result from decreased import duties, the statement continues. American steelworkers receive three and one-half times the wages paid in Belgium, thus giving producers in that country a decided advantage in the major cost factor.

Committee's deadline for filing briefs and applications for oral testimony expired Sept. 27.

Mr. Tower's statement:

"It has come to our attention that the department of state issued on Aug. 16 formal notice of intention to negotiate a new reciprocal trade agreement with Belgium, and that among the items on which the United States will consider granting concessions to Belgium are a number of products of the iron and steel industry, including all those covered by the original agreement with Belgium, some items which have appeared in other reciprocal trade agreements, and some additional items which have not previously appeared in any such agreement. . . .

Points to Uncertainties

"In our comments on the proposed revision of the Belgian agreement we shall not attempt to include the possible effect of present-day and future abnormal conditions which arise from a state of war in Europe, but shall confine the discussion to a peace-time basis. We do, however, strongly recommend, in view of the above-mentioned uncertainties, that even though briefs are filed and hearings may be held in respect to such an agreement, further negotiations with Belgium be indefinitely postponed.

"Belgium is, as official figures show, the outstanding source for semifinished and finished steel products into the United States, having been responsible for 46 per cent of such imports by tonnage during the year 1938 and for 40 per cent of such imports during the first six months of the current calendar year. . . .

"A fact which we wish again to bring to your attention is that iron and steel producers in Belgium and other foreign countries already have a substantial advantage in one of the chief items of cost as compared with producers in the United States, because of the much lower level of wages paid to labor in those foreign countries.

"The average hourly earnings of American iron and steel workers in the year 1938 amounted to 83 cents, which figure, according to our latest available information, is approximately three and one-half times the average hourly rate in the Belgian iron and steel industry and nearly three times as much as the general average for foreign iron and steel making countries.

Domestic Producers Handicapped

"Any tariff concessions on iron and steel products granted under the proposed revision of the Belgian agreement will, of course, serve only to give foreign producers a further advantage in competing with domestic producers in the American market.

"Moreover, any such advantage will, of course, accrue not only to Belgian producers but also to iron and steel producers of all other foreign countries with which commercial treaties of the United States provide for most-favored-nation treatment.

"Another point which should be considered is the argument, frequently made but quite misleading, that because iron and steel imports are equal to only a small fraction of total domestic production, any action relative to imports must necessarily have only a correspondingly small competitive effect upon the domestic producer. Such a contention, however, is not borne out by the facts.

"While it is true that imports of iron and steel products commonly constitute only a small fraction of total domestic consumption and that the sale or use of such imports is largely confined to seaboard areas, nevertheless the ultimate competitive effect may be widespread for the reason that the distributors or users of such products who are located along the seaboard are in direct competition with inland distributors or users. The competitive advantage which a seaboard consumer may gain through the use of foreign iron and steel products is often so considerable as to render his inland competitor unable to meet that competition. That situation may again be repeated through other links in the competitive chain, thus, by a process of infiltration, extending the effect of competition of iron and steel imports far inland.

"Furthermore, the seaboard areas, which are directly exposed to active competition from imports of foreign iron and steel products, are among the principal steel markets in this country. Practically all domestic iron and steel producers, both seaboard and inland, depend at least in part on those seaboard markets as outlets for their products.

"We believe that after all there is no real economic necessity or reason for imports of iron and steel products into the United States, either from Belgium or from any other country, because the productive capacity of the iron and steel industry in the United States is now, and has long been, ample to supply the demand.

"It seems to us that perhaps the sole ground which could be urged for such imports is one of price only, as made possible largely by low wage levels in foreign countries. But in any consideration of such price, the fact must not be forgotten that American wage levels and a fair return to the investors who have furnished the capital for the steel industry are inseparably involved.

Steel's Declining Returns

"We believe that it would not be inappropriate to mention here a few outstanding facts concerning the financial position of the iron and steel industry. The return on the industry's invested capital over the past two decades has shown a steadily downward trend. During the ten-year period 1919-1928 the average return was 5.1 per cent, which was modest enough in itself. However, for the following decade, 1929-1938, such return fell off to 2.4 per cent and for the first half of the current year it had dwindled to 1.06 per cent.

"Furthermore, during the year 1938 taxes exceeded available net earnings by nearly 18 per cent, causing a net loss to the industry of almost $15,000,000 before dividends. Certainly it does not seem logical to impose upon a domestic industry in that financial position further handicaps along the lines of decreased import duties on the products of its foreign competitors.

"For all of the above reasons, it is strongly urged, on behalf of members of the iron and steel industry, that further concessions shall not be granted on iron and steel products if it be finally decided to proceed with the proposed revision."

What's New at Pittsburgh . . .

By R. L. HARTFORD
Pittsburgh Editor, STEEL

■ ABOUT to be introduced is a new instrument developed by Jones & Laughlin Steel Corp.'s metallurgists for determining carbon content in open-hearth baths and enabling closer control. Known as the "Carbanalyzer," device will be manufactured here by Fisher Scientific Co. under license from J. & L. It will be introduced to the industry at the Metals show in Chicago.

Comparable in accuracy to chemical analysis, the instrument operates with the speed of an ordinary fracture test. Readings are taken in a few seconds and the complete operation, including preparation of the sample, requires less than five minutes. Rugged, portable and self-contained, the unit is not affected by temperature changes or normal mill vibration. Calibration is made against actual chemical analyses, and since the results show a smooth curve but few readings are needed to establish a satisfactory scale.

Instrument is low in cost and simpler in operation than previous devices. It has been undergoing tests for some time in J. & L. laboratories, while sample units have been tested under operating conditions for nearly a year.

♦

New Plant for Copperweld

Copperweld Steel Co. has acquired assets of American Puddled Iron Co., Warren, O., and will erect on the 423-acre property an electric steel plant with nominal capacity of 100,000 tons of alloy steel annually.

At the new plant, which will be ready during the first quarter of 1940, Copperweld will produce its own steel for use in the manufacture of copper-covered steel wire, rods and strand.

Announcement by S. E. Bramer, president, states that it was found impractical to locate the new electric steel plant on the company's main property at Glassport, Pa., in the Pittsburgh district, because of insufficient acreage.

Included among the assets purchased from American Puddled Iron are a 29-inch blooming mill and a 24-inch billet mill. Copperweld has acquired from other sources an 18-inch, a 12-inch and a 9-inch finishing mill which are capable of reducing ingots to quarter-inch rods.

The Puddled Iron company's buildings at Warren will furnish only a nucleus for the new Copperweld plant. Several additional buildings have been acquired to house a portion of the equipment. The projected plant when completed will have buildings with floor area of 330,000 square feet.

Melting equipment for the new steel plant will consist of two large and two small electric furnaces.

The Puddled Iron company's plant was last operated under lease by the A. M. Byers Co., of Pittsburgh, from 1928 to 1930.

♦

Continuous Strip Cleaner

A new electro-mechanical continuous unit for cleaning strip steel before annealing has been developed by Electrochemical Processes division of Blaw-Knox Co., 2042 Farmers Bank building, Pittsburgh. A faster and sharper cleaning action with an appreciably lower consumption of current and lower cleaning costs are claimed for the new method.

Although the unit is designed to clean 1500 feet of strip per minute, it is only 95 feet long from payout reel to windup reel. Loss and delays due to folded or damaged strip are minimized by a cold-mill type of electrical strip tension control for the full length of the cleaner, and fully automatic control of the solution and temperature is provided. The company reports that electrocleaners now in service can be converted to this new type.

♦

Ignitron Rectifier in Steelworks

The first ignitron rectifier to be used in a steel mill will be a 1000-kilowatt, 250-volt Westinghouse unit purchased by the Carnegie-Illinois Steel Corp. for its Edgar Thomson works, Braddock, Pa. This unit will tie into the plant bus and furnish power for miscellaneous direct current equipment, including direct current blast motors on a furnace.

The ignitron rectifier and associated apparatus will be designed to operate from a three-phase, 6600-volt power-supply system. It will consist of two assemblies of six ignitron tubes, each being complete with equipment for maintaining and indicating vacuum. The unit will be rated 1000 kilowatts at 250-volt direct current continuously with overload capacity of 125 per cent for two hours and 200 per cent for one minute. The rectifier unit will be completely automatic.

Work on the unit is being pushed so it can absorb part of the load increase arising from the spurt in operations.

■ Fabricated steel plate orders reported to the bureau of the census totaled 21,828 net tons in August; 31,364 tons in July and 22,069 tons in August, 1938.

Republic Steel's Expansion Plans

■ MORE than $3,000,000 has been appropriated by Republic Steel Corp., Cleveland, for expansion and improvement of plant facilities. Work will be started as soon as necessary materials are received. Improvements include:

Youngstown, O.—New equipment and rearrangement of present facilities for cutting and threading pipe so as not to interfere with straight-line production. Rebuilding, enlarging and providing facilities for producer gas furnace firing on No. 10 open hearth. Enlarging benzol recovery plant capacity.

Warren, O.—Improving and adding to facilities in hot mill to permit increased capacity for narrow strip steel, together with increased furnace capacity to permit the handling of 30-foot billets. Increasing capacity of the pouring aisle crane in the open-hearth department to permit handling larger heats; new 170-ton ladles, buggies and boxes for the open-hearth department.

Niles, O. — Addition of a third cleaning and cutting line for tin plate.

Canton, O.—Installation of a new 50-ton electric furnace, largest in the corporation; transfer of an electric furnace from Buffalo to Canton will bring total active furnaces to seven.

Galvanizing units at Stark division will be increased by replacing two small units with two of larger capacity and modernizing two other units.

Berger manufacturing division's equipment for manufacturing kitchen cabinets will be increased and improved.

Cleveland—Capacity of two open hearths will be increased and will be provided with facilities for producer gas firing at Corrigan-McKinney. A 66-inch hot-rolled coil trimming and slitting line is being installed in the new strip mill. A new charging machine replaced in the open-hearth department and a new stripper crane installed.

Six new boltmaking machines will be purchased for the Upson division.

Buffalo—Stove on the No. 2 blast furnace will be rebuilt.

Birmingham, Ala.—New mechanical coal handling equipment for one of the southern coal mines.

Gadsden, Ala.—New slab heating furnace at the 112-inch plate mill.

In addition, less important improvements will be made in virtually every Republic operating district.

Many Difficult Problems Ahead, Fairless Tells Steel Engineers

■ IRON AND STEEL engineers in coming years will practice more "human engineering" while passing on their work and experience to the next generation, declared Julius A. Clauss, chief engineer, Great Lakes Steel Corp., Ecorse, Mich., and newly-elected president of the Association of Iron and Steel Engineers, in his address before its annual meeting at William Penn hotel, Pittsburgh, Sept. 26-29.

Wednesday afternoon 850 delegates visited Carnegie-Illinois Steel Corp.'s new Irvin works. Friday morning several hundred members and guests toured the corporation's Edgar Thomson works at Braddock, Pa.

Held in conjunction with the convention was the iron and steel exhibition, covering 20,000 square feet in area. Various manufacturers displayed their latest equipment.

Technical sessions covered a wide range of problems in electrical, mechanical, welding, combustion and lubrication engineering and iron and steel operating practice. Resume of these sessions is presented on pp. 49-52.

B. F. Fairless, president, United States Steel Corp., Pittsburgh, was principal speaker at the banquet Thursday evening. Said Mr. Fairless, in part:

"This industry which engages our mutual interest is of momentous value to all people, for it provides so many of mankind's important requirements. Our first concern is to see that an efficient and progressive steel industry stands ready to meet its obligations insofar as the efforts of an efficient and progressive personnel can bring it about.

Human Nature Unbridled

"Signs of the times indicate that for an unknown period, you, as engineers of the iron and steel industry, will be called upon to deal with many difficult problems arising from the present critical situation.

"The world's present distressing condition is evidence enough that the roadway leading into the future is still beset with the same old difficulties that have plagued mankind since earliest days. All the knowledge and experience acquired by the human race in centuries of patient endeavor have not been sufficient to forestall the use of destructive violence as a means of attaining certain aims and ambitions in shaping the destinies of the world of tomorrow.

"Although men have learned to deal in an enlightened manner with nature, they have failed as yet to deal wisely enough with human nature. As professional and business men we are appalled at the possibilities inherent in this present struggle.

"In large measure the long work day of the nineteenth and earlier centuries has gone from industry. Real wages have increased. Much of the drudgery of work has been shifted from human shoulders to machines. The lightening of burdens has reached into millions of households, factories, mines and fields. Natural resources are more efficiently used and effectively conserved by the application of scientific methods. Thousands of useful products unknown to our forefathers now make living progressively easier.

Scientific Approach Desirable

"Enormous strides have been taken in the improvement of processes, equipment and products. The methods of science and engineering have come more into play without the sacrifice of any real values. Today the steel industry is equipped as never before to serve the people's needs.

"What avails all this progress and improvement in one sector of life if it can be nullified by the use of unwise methods in another? Why develop conditions for better living if men cannot learn to live together?

"Might it not be possible to apply more of the scientific or engineering approach to the solution of political and international problems in hope of securing more of its characteristic results? A system which can prove its effectiveness over a long period of years certainly deserves serious consideration in every quarter. Let us make an effort to have more of its principles injected into the handling of political matters.

"Engineers along with others who use or approve the objective and dispassionate procedure would do well to make their voices heard as citizens, calling upon political leadership everywhere to partake of their methods in the solution of international problems."

Officers Elected by Iron and Steel Engineers

President

J. A. Clauss, chief engineer, Great Lakes Steel Corp., Detroit.

First Vice President

W. A. Perry, superintendent electric and power departments, Inland Steel Co., Indiana Harbor, Ind.

Second Vice President

T. E. Hughes, superintendent maintenance, Carnegie-Illinois Steel Corp., Duquesne, Pa.

Director-at-Large

C. R. McGranahan, assistant general superintendent, Jones & Laughlin Steel Corp. Pittsburgh.

Treasurer

F. E. Flynn, district manager Republic Steel Corp., Warren, O.

Secretary

J. L. Miller, assistant chief combustion engineer, Republic Steel Corp.

Directors

F. P. May, assistant chief engineer, Carnegie-Illinois Steel Corp., Clairton, Pa.

C. E. Adams, electrical superintendent, Youngstown Sheet & Tube Co., East Chicago, Ind.

L. V. Black, superintendent electrical department, Bethlehem Steel Co., Bethlehem, Pa.

L. R. Milburn, electrical engineer, Great Lakes Steel Corp., Detroit.

F. M. Sturgess, master mechanic and chief electrical engineer, Tennessee Coal, Iron & Railroad Co., Fairfield, Ala.

F. W. Lorig, construction engineer American Steel & Wire Co., Cleveland.

J. A. Clauss

M. J. Conway, fuel engineer, Lukens Steel Co., Coatesville, Pa.

A. W. Steed, superintendent of maintenance, American Rolling Mill Co., Middletown, O.

F. L. Gray, lubrication engineer, Carnegie-Illinois Steel Corp., Gary, Ind.

Honorary Directors

James Farrington, electrical superintendent, Wheeling Steel Corp., Steubenville, O.

E. Friedlander, Pittsburgh.

A. C. Cummins, assistant manager operations, Pittsburgh district, Carnegie-Illinois Steel Corp., Pittsburgh.

C. C. Wales, Cleveland.

L. F. Coffin, superintendent mechanical department, Bethlehem Steel Co., Sparrows Point, Md.

August Exports Up 13 Per Cent

■ EXPORTS of iron and steel products in August, excluding scrap, totaled 185,182 gross tons, 13 per cent larger than July shipments of 163,598 tons, according to the metals and minerals division, bureau of foreign and domestic commerce. Aggregate for eight months this year is 1,272,055 tons, compared with 1,388,819 tons in the 1938 period.

Heavier exports were noted in various items, pig iron increasing from 6021 tons to 9214; nonalloy plates from 13,930 tons to 19,371 tons; skelp from 3584 to 9039 tons; nonalloy sheets from 19,519 to 26,426 tons; tin plate from 22,264 to 27,169 tons and nonalloy strip from 3330 to 7682 tons.

Steel ingots were exported in smaller volume, 4960 tons, compared with 9672 tons in July. Nonalloy bars totaled 7029 tons against 11,311 tons.

Scrap exports amounted to 291,896 tons, 16.6 per cent less than 350,066 tons in July. Scrap exported in the first eight months aggregated 2,430,914 tons. In the comparable period, 1938, the tonnage was 2,032,740.

Total exports in August, including scrap, were 477,078 tons, against 513,664 tons in July. For eight months the total is 3,702,969 tons, compared with 3,481,568 tons in the 1938 period.

UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Articles	Aug. 1939	July 1939	Jan. thru Aug.'39
Pig iron	9,214	6,021	43,168
Ferromanganese and spiegeleisen	27	147	212
Other ferroalloys	504	135	1,316
Ingots, blooms, etc.:			
Not containing alloy	4,960	9,672	63,796
Alloy incl. stainless	111	8	6,727
Steel bars, cold fin.	1,354	224	5,340
Bars, iron	41	62	414
Bars, concrete	3,091	3,257	19,995
Other steel bars:			
Not containing alloy	7,029	11,311	72,845
Stainless steel	15	19	227
Alloy, not stainless	882	432	8,708
Wire rods	1,477	3,706	15,786
Boiler plate	988	562	4,358
Other plates, not fab.:			
Not containing alloy	19,371	13,930	160,688
Stainless steel	33	11	84
Alloy, not stainless	181	312	1,180
Skelp iron or steel	9,039	3,584	17,260
Sheets, iron	526	748	3,937
Sheets, galv. steel	9,886	9,201	62,609
Sheets, "black" steel:			
Not containing alloy	26,426	19,519	178,370
Stainless steel	41	119	593
Alloy, not stainless	408	398	2,351
Sheets, black iron	727	546	4,610
Strip steel, cold-rolled:			
Not containing alloy	2,076	1,331	12,859
Stainless steel	41	120	452
Alloy, not stainless	60	21	312
Strip steel, hot-rolled:			
Not containing alloy	7,682	3,330	35,218
Stainless steel	10	67	228
Alloy, not stainless	9	6	45
Tin plate, taggers' tin	27,169	22,264	148,388
Terne plate	591	348	2,868
Tanks, except lined	1,661	2,445	17,667
Shapes, not fabricated	8,771	10,078	60,518
Shapes, fabricated	2,983	1,988	21,023
Plates, fabricated	377	229	2,767
Metal lath	121	101	699
Frames and sashes	113	51	666
Sheet piling	1,339	439	4,713
Rails, 60 lbs.	1,252	2,277	28,336
Rails, under 60 lbs.	459	715	2,763
Rails, relaying	1,454	2,565	10,731
Rail fastenings	192	664	5,493
Switches, frogs, crsgs.	96	148	1,538
Railroad spikes	156	133	1,962
R. R. bolts, nuts, etc.	95	99	975
Boiler tubes, seamless	773	546	4,810
Boiler tubes, welded	35	9	292
Pipe:			
Smls. casing, oil-line	5,773	3,292	39,685
do welded	372	817	2,506
Seamless black	641	577	4,958
Pipe fittings:			
Mall. iron screwed	317	346	2,464
Cast iron screwed	193	204	1,587
Pipe and fittings for:			
Cast iron pressure	2,449	857	15,668
Cast iron soil	1,218	752	5,725
Pipe, welded:			
Black steel	1,215	1,535	11,062
Black wrought iron	483	545	2,472
Galvanized steel	1,369	1,277	13,183
Galv. wrought iron	199	234	1,968
*All other pipe, fitgs.	597	644	3,309
Wire:			
Plain iron or steel	2,940	2,100	17,646
Galvanized	1,516	1,944	16,382
Barbed	3,449	4,627	27,893
Woven-wire fencing	202	164	1,900
Woven-wire screen cloth:			
Insect	35	41	287
Other	66	84	851
Wire rope and cable	171	319	2,384
Wire strand	72	86	618
Electric welding rods	89	142	979
Card clothing	2	2	28
Other wire	578	573	4,978
Wire nails	1,726	1,890	12,866
Horseshoe nails	70	73	571
Tacks	32	18	182
Other nails, staples	431	434	2,818
Bolts, machine screws	570	630	5,195
Castings:			
Gray iron (incl. semi-steel)	279	276	2,312
Malleable iron	24	37	625
Steel, not alloy	100	106	731
Alloy, incl. stainless	116	219	1,072
Car wheels, tires, axles:			
† Wheels and tires	1,247	812	6,927
† Axles, no wheels	273	2,142	7,046
† Axles with wheels	718	511	3,763
Horseshoes and calks	22	2	149
Forgings, n. e. s.:			
Not containing alloy	1,697	1,324	7,993
Alloy, incl. stainless	85	64	1,375
Total	185,182	163,598	1,272,055
Scrap, iron and steel	290,346	347,249	2,413,610
Scrap, tin plate	977	1,261	6,538
Tin pl., circles, strips, cobbles, etc.	162	969	4,638
Waste-waste tin plate	411	587	6,128
Total scrap	291,896	350,066	2,430,914
GRAND TOTAL	477,078	513,664	3,702,969
Iron ore	147,196	158,227	506,755

*New class. Includes flanged malleable cast iron fittings, expansion joints, and riveted pipe and fittings.
†New class.

Machinery Exports Increase 17 Per Cent

■ August exports of industrial machinery, valued at $25,807,101, were 17 per cent larger than those of August, 1938, at $22,067,799, according to the machinery division, department of commerce. In power generating equipment, excluding electric and automotive, the gain was 13 per cent, from $1,384,950 to $1,560,056.

Power-driven metalworking machinery exports in August were valued at $9,870,911, an increase of 14 per cent over $8,625,729 in August, 1938. Practically all classes of machine tools participated in the gain. Metalworking equipment, not power-driven, increased 32 per cent, $439,774 against $332,580. Excavating and road-building machinery exports gained materially, the main factor in an advance of 27 per cent in construction and conveying equipment.

Steelmakers Give Neutrality Views

■ REPEAL of the neutrality act's arms embargo provision was advocated by T. M. Girdler, chairman, Republic Steel Corp., Cleveland, in an address before a joint session of Founder Engineering societies of Cleveland last week.

Urging that the United States keep out of the European war, Mr. Girdler declared the nation cannot "legislate peace through an embargo on the shipment of arms or munitions.

"I stand with those who believe that repeal is in accord with the public opinion of the country and that it would not, in itself, carry us into the war, particularly if we have a cash-and-carry provision so that materials would not be transported in American ships."

Benjamin F. Fairless, president, United States Steel Corp., told newsmen in New York he favors neutrality act revision as outlined by President Roosevelt. Proposed changes, he believes as an individual, offer the best means to preserve true neutrality and peace in this country.

Frank Purnell, president, Youngstown Sheet & Tube Co., Youngstown, O., also is quoted as favoring modification of the arms embargo.

Opposition to lifting of the embargo was expressed by Ernest T. Weir, chairman, National Steel Corp., and president, American Iron and Steel institute, in an interview in Pittsburgh last week.

"The United States should at no time manufacture direct munitions for sale to other countries whether they are at war or at peace," he stated.

"We are not interested in war business; what we are interested in is that we don't get into the war.

"War never produces anything healthy; there's a collapse when the war is ended and losses are incurred through heavy inventories and high prices.

"There must be no blackout of our domestic problems. Although war diverted our attention from these problems, they are still with us just as they were a month ago."

Acute Tungsten Shortage Unlikely; Substitutes, Domestic Ores Developed

NEW YORK

■ DESPITE the war, no fear is expressed over a shortage of tungsten sufficient to disrupt production in this country. A necessary metal, tungsten is not as essential as at the opening of the World war.

High-speed steel with 18 per cent tungsten, 4 per cent chromium and 1 per cent vanadium continues the "old reliable." It has a broad hardening range. It is regarded more or less foolproof. Large and small shops are accustomed to handling it.

However, a number of high-speed steels containing little or no tungsten introduced in the past few years offer considerable promise. One contains about 8 per cent molybdenum, 2 per cent tungsten, 4 per cent chromium and 1 per cent vanadium. Another includes 8 per cent molybdenum, 4 per cent chromium and 2 per cent vanadium. The Watertown arsenal has done considerable work on these.

According to tool steel makers, these two types provide satisfactory cutting results but require special care in heat treatment. They decarburize easily but this may be readily prevented by dipping in borax in the heat treatment. Decarburization also may be prevented by treatment in salt bath or controlled atmosphere furnaces. Of course, vast improvements have taken place in heat treating methods and controls since 1914. Work also is being done on a number of low-alloy steels, containing 3 to 6 per cent each tungsten and molybdenum.

Progress in Carbides

Tungsten carbides have made much progress. Tungsten may be used alone or in combination with other metal carbides, including titanium and tantalum. Here tungsten is practically essential. At the beginning of the World war tungsten carbides had not been developed.

Then about 90 per cent of the magnet steels contained tungsten but chromium and alnico types are dominant today. Heat resistant steels use tungsten only to a limited extent.

Considerable quantities of tungsten are used for electric light and radio tube filaments, but recently fluorescent gas-filled lamps for all types of lighting have been developed.

While substitutes for tungsten have made progress, it is not believed that the metal can be entirely replaced, even in a state of extreme emergency. Furthermore, complete replacement of tungsten is not seen necessary or desirable.

In 1937, the United States was the second largest producer of tungsten ore although the tonnage was only about one-sixth that produced by China. Domestic ores are low in metal content, but reserves are said to be large enough to supply domestic requirements, if necessary.

Nevada and California are the principal tungsten producing states and production capacity has been increased considerably in the past two or three years. Ore is produced in commercial quantities in eight other states, including Arizona, Colorado, Idaho, Missouri, Montana, New Mexico, Utah and Washington.

China normally supplies more than 60 per cent of domestic requirements and it is still possible to obtain Chinese ore by way of India and Indo-China. With the new turn of events in the Far East, it cannot be determined how long Chinese ore can be imported. However, it probably would be possible to call on Bolivia, Argentina, Indo-China, Malaya and Portugal for supplies.

"Electric Motor of Tomorrow" at New York Fair

■ **A completely Fiberglas-insulated motor in a standard 5-horsepower frame size is shown at the left delivering, consistently, the same power as the standard cotton-wound 10-horsepower motor, right. Motors are hooked up to a dynamometer through coupling and load may readily be alternated from one to the other. Gages show the small motor, some 160 pounds lighter in weight and 45 per cent smaller in volume, will develop the same power as the larger standard motor**

Warner & Swasey Expands Turret Lathe Output

■ Expanding its output of turret lathes to meet sharply increased demand, Warner & Swasey Co., Cleveland, since Sept. 1 has purchased new production machinery and equipment costing nearly $300,000.

While machine tool buying for foreign and domestic defense programs gained materially following outbreak of European hostilities, according to President Charles J. Stilwell, the largest increases in orders have come from manufacturers supplying the country's normal peacetime needs. Substantial upturn has been noted in bookings from the electrical equipment, plumbing supply, printing machinery, oil field equipment, heating and hardware industries.

Booked virtually to capacity for several months ahead, the company is working three shifts a day.

■ Household electric refrigerator sales in August were 88,108 units, compared with 152,726 in July; 86,729 in August, 1938; and 112,112 in August, 1937. Eight months' sales were 1,556,624 units, against 1,027,236 in the like period in 1938, and 1,877,975 in the corresponding months, 1937, the record year for the industry.

MEN OF INDUSTRY

■ STANLEY A. KNISELY, advertising manager, Republic Steel Corp., Cleveland, has resigned to become executive vice president, Associated Business Papers, New York. Mr. Knisely is immediate past president, Associated Industrial Advertisers' association and vice president, Exhibitors Advisory Council Inc. Beginning as a reporter for the Canton, O., *Daily News*, he rose to managing editor before going to Cleveland as telegraph editor of the *Plain Dealer*. Leaving newspaper work in 1921, he became assistant secretary, National Paving Brick Manufacturing association and later director of advertising and research, National Association of Flat Rolled Steel Manufacturers.

Associated with Republic Steel since 1934, Mr. Knisely has been closely connected with business papers for almost 20 years, is an active member of National Advertisers' association.

♦

David Findlay, heretofore first vice president and general sales manager, L. S. Starrett Co., Athol, Mass., has been elected president, succeeding Frank A. Ball who now is chairman of the board of directors. Arthur H. Starrett becomes vice president. William J. Greene has been appointed general sales manager for the company, and Lloyd I. Williams Pacific coast sales manager. R. J. O. Simpson retires as manufacturing department superintendent to become consulting engineer and is succeeded by William D. Starrett. William A. Thorp becomes assistant superintendent.

♦

Richard Cunningham has been named stainless steel sales manager, Industrial Steels Inc., Cambridge, Mass. Associated with American

Richard Cunningham

Stanley A. Knisely

Rolling Mill Co., Middletown, O., for the past 12 years, Mr. Cunningham has served the latter company

Charles McDonough

Who, as reported in STEEL, Sept. 25, page 31, has been elected president, National Industrial Advertisers' association. Mr. McDonough is advertising manager, Combustion Engineering Co., New York

first as metallurgical consultant, later as stainless steel sales engineer.

♦

Frank C. Miller has been named western sheet and strip sales manager for Youngstown Sheet & Tube Co., Youngstown, O., with headquarters in Chicago. John M. Tuthill was appointed assistant manager of flat rolled sales, working from the company's general offices. Arthur N. Vogt heads the Youngstown district; J. F. Heil, San Francisco area; A. G. Oakley, southern California, with headquarters in Los Angeles.

♦

Francis James Gavin has been elected president, Great Northern railway, after serving 42 years in many capacities. Mr. Gavin has been executive vice president since the death, last May, of William P. Kenney whom he succeeds.

♦

Clarence Avildsen, chairman, board of directors, United Tool & Drill Corp., Chicago, has been appointed special adviser to the secretary of commerce. Mr. Avildsen will study financial problems facing small business throughout the nation, and other problems of industry, including plant modernization, patents and monopolies.

♦

Charles T. Lawson has been appointed household appliance sales manager for Kelvinator division, Nash-Kelvinator Corp., Detroit. He will head all Kelvinator and Leonard refrigerator, electric range, electric water heater, washing machine and ironer sales.

♦

John C. Dabney has been named Seybold division sales manager for Harris-Seybold-Potter Co., Cleveland. Seybold factory, Dayton, O., manufactures precision paper cutters, wire stitchers, drilling machines and kindred equipment. William Kinzeler, whom Mr. Dabney suceeds, becomes central district sales manager. Glenn Baber was appointed assistant sales manager.

♦

Dr. Francis C. Frary, research laboratories, Aluminum Co. of America, Pittsburgh, has been awarded the Acheson medal and $1000 prize for "distinguished contributions to electrometallurgy." Highest award for scientific achievement bestowed by Electrochemical Society, Acheson medal was presented Dr. Frary in recognition of aluminum alloys development.

♦

W. F. Daly has been appointed St. Louis district office manager for Allis-Chalmers Mfg. Co., Milwaukee. C. L. Orth, whom he succeeds, will continue in a consulting and sales

W. F. Daly

capacity. Mr. Daly has been associated with Allis-Chalmers' Chicago office since 1924, dealing with power and electrical equipment, especially power house apparatus. He is an associate member American Institute of Electrical Engineers.

♦

James Dixon has been appointed acting general manager, Ridgway plant of Elliott Co., Jeanette, Pa. Formerly assistant to general manager, Mr. Dixon succeeds R. H. Gaither who resigned as vice president of the Elliott company and general manager of the Ridgway plant. Company manufactures power and industrial process machinery.

♦

Milton Knight, formerly secretary, Libbey-Owens-Ford Glass Co., Toledo, O., has been named to a newly-created vice presidency to co-ordinate structural, special glass products sales and manufactures. Herbert H. Baker, vice president and a director of the company, will reassume Mr. Knight's position as secretary.

Waldo F. Tucker

Who, as reported in STEEL, Aug. 21, page 22, has been appointed Los Angeles office manager, Acme Steel Co., Chicago. Mr. Tucker has been associated with the company 13 years

♦

J. G. Gammel has been appointed assistant advertising manager, Osborn Mfg. Co., Cleveland. He formerly was associated with several advertising agencies in New York.

♦

Mayo D. Hersey has become research director for Morgan Construction Co., Worcester, Mass., after 15 years service with national bureau of standards, Washington. While in government service he organized the bureau's aeronautic instruments and friction and lubrication sections. Member of the research committee, American Society of Mechanical Engineers, Mr. Hersey is author of "Theory of Lubrication." He has been associate professor, properties of matter, at Massachusetts Institute of Technology; physicist in charge of the physical laboratory, Pittsburgh experiment station, United States bureau of mines; test department head, Kingsbury Machine Works Inc., Philadelphia.

Mayo D. Hersey

♦

George O. O'Hara has been named electrode division sales manager, Great Lakes Carbon Corp., Niagara Falls, N. Y. Born and educated in Australia, Mr. O'Hara came to the United States in 1922, has been associated since with steel and carbon industries.

♦

George E. Scott has been elected vice president and assistant sales manager, Scullin Steel Co., St. Louis. Formerly purchasing agent for Missouri-Kansas-Texas railroad, St. Louis, Mr. Scott had been associated with railroad transportation systems since 1901.

♦

C. E. McIntyre, Cleveland district assistant sales manager, Carnegie-Illinois Steel Corp., Pittsburgh, has also been made Buffalo office manager for the company. Mr. McIntyre's entire business career has been spent with Carnegie. Starting in 1911 he first worked in various clerical capacities, later joined the sales division.

C. E. McIntyre

♦

A. Y. Peterson, vice president, Oliver Iron Mining Co., Duluth, has been elected president, Lake Superior Mining institute, succeeding A. D. Chisholm. R. S. Archibald, Negaunee, Mich., was elected treasurer of the organization, C. J. Stakel, Ishpeming, Mich., re-elected secretary.

♦

R. B. Moir has been appointed sales research and engineering development director for Foote Bros. Gear & Machine Corp., Chicago. Mr. Moir was formerly chief engineer, W. A. Jones Foundry & Machine Co., Chicago.

♦

Alvin L. Miller, president, Miller Tool & Mfg. Co., Detroit, has been elected president, Detroit unit, National Small Businessmen's association.

DIED:

■ OTTO DUNKEL, structural engineer, identified with steel fabricating industries in Los Angeles since 1900, at his home in Los Angeles, Sept. 10. For many years he was chief engineer, Llewellyn Iron Works, which later merged with Consolidated Steel Corp., Los Angeles. Recently he had been associated with Kinney Iron Works, Los Angeles, developing new applications for Meehanite.

♦

Wilbur B. Lewis, 56, traffic manager for Woodward Iron Co., Woodward, Ala., and the Alabama Mining institute, at Birmingham, Ala., Sept. 21. Mr. Lewis was formerly traffic manager for Sloss-Sheffield Steel & Iron Co., Birmingham.

♦

Creighton M. Konkle, 62, comptroller, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., United States Steel subsidiary, at his home in Birmingham, Sept. 24. Mr. Konkle had been associated with United States Steel affiliates since 1901, was a member American Comptrollers Institute of America and American Iron and Steel institute.

♦

Bonnell McElevey, 73, at one time assistant superintendent of the former Mahoning Valley Iron Co., Youngstown, O., in Asheville, N. C., Sept. 17.

♦

William T. Adams, 76, president, Adams Mfg. Co., Reading, Pa., and Berks Foundry & Mfg. Co., West Hamburg, Pa., in Reading.

♦

Henry C. Quigley, 67, retired electrical engineer, at his home in Montclair, N. J., Sept. 19.

Windows of WASHINGTON

By L. M. LAMM
Washington Editor, STEEL

WASHINGTON

■ CONSENSUS here has it the senate will discuss the new neutrality bill for two or three weeks, meeting each day from 11 a. m. to 5. p. m.

As congress seems to agree that nothing but neutrality be considered this session, an agreement was reached in the house last week to meet twice weekly, on Mondays and Thursdays, until Oct. 9. No business is to be transacted until then and it is reported house leaders hope to extend this procedure until senate has passed the bill.

Senator Key Pittman, chairman of the foreign relations committee, discussing the bill last week said that "the bill has for its sole purpose the maintenance of our neutrality and keeping us out of war. I am sure it will accomplish it.

Violations Will Be Penalized

"This is the first time in our history a law has been proposed that absolutely prohibits American vessels from carrying materials of any character to a belligerent. It was the loss of American lives and the destruction of American ships that led us into the World war. Under this legislation that can never happen again."

The new neutrality bill repeals outright the neutrality laws of 1935 and 1937, sounding the death knell of the arms and munitions embargo.

Section 1 authorizes the President to proclaim a state of war between nations whenever he, or congress by concurrent resolution, shall find a state of war existing, and that it is necessary to preserve the peace of the United States.

Section 2 provides that whenever the President shall have issued the proclamation that a state of war exists between foreign nations, it shall thereafter be unlawful for any American vessel to carry any passengers or any articles or materials to any state named in the proclamation.

An exception is made of transportation on lakes, rivers and inland waters bordering on the United States and transportation on or over lands bordering on lands of the United States. Such transportation, however, shall be governed by regulations prescribed by the President.

Heavy penalties are provided for any violations of this "carry" provision of the bill. Any person convicted of a violation shall be fined not more than $50,000, or imprisoned for not more than five years, or both. If the violation is by a corporation or other organization, each officer or director participating in the violation shall be liable to the penalty.

The "title" provision of the bill declares that it shall be unlawful to export or transport any articles or materials from the United States to any belligerent nation until all right and title therein shall have been transferred to some foreign government or its nationals.

Section 3 authorizes the President by proclamation to define combat areas and provides that thereafter it shall be unlawful, except under such regulations as may be prescribed, for any citizen of the United States or any American vessel to proceed into or through such combat areas.

To Protect Neutrality

This provision is intended to make it possible for the President to take whatever steps necessary to prevent any American or American vessels from endangering the neutrality of this country in the event of a foreign war. In case of a violation by an American ship and ship owners and officers, fines of not more than $50,000 or imprisonment of not more than five years, or both, may be imposed. In case the violation is by a citizen traveling as a passenger, he may be fined not more than $10,000 or imprisoned not more than two years or both.

No American citizens shall travel on the vessel of a belligerent nation after the outbreak of war and the issue of a proclamation by the President, nor shall American merchant vessels engaged in commerce with any foreign states be armed.

Section 7 deals with financial transactions. It provides that no person within the United States shall buy bonds or securities of any belligerent state. It is provided, however, that if the President shall find it necessary to protect the commercial or other interests of the United States or its citizens, he may at his discretion except ordinary commercial credits from the operation of this section for a period of not more than 90 days without renewals.

There is inserted in the bill a provision that the President shall report to congress every six months all exceptions granted under this provision, together with the amounts of credits involved. Any one who violates the financial provisions of the bill also will be subject to penalty.

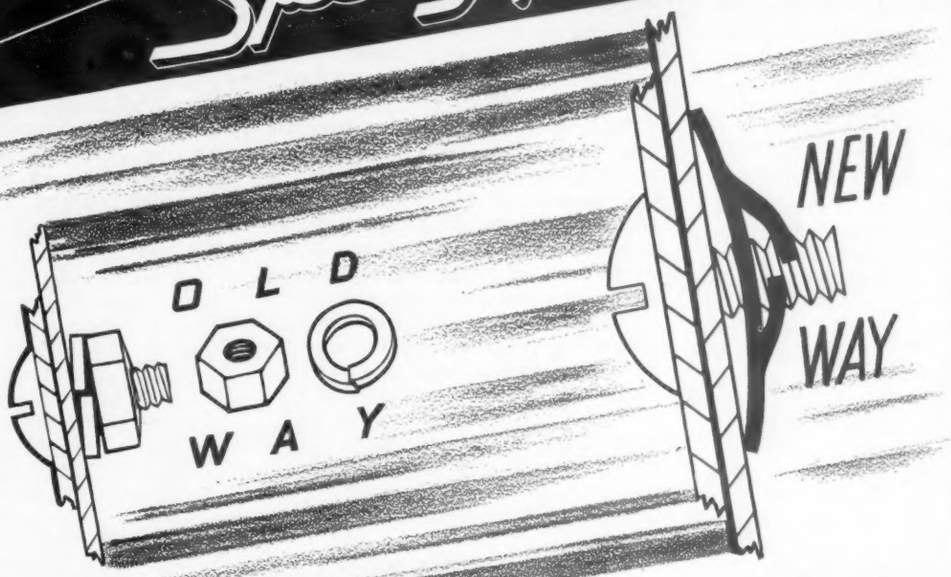
The bill retains the national munitions control board. Every manufacturer, exporter or importer of arms or munitions must register with the secretary of state his name, place of business in the United States, and the implements of war which he manufactures, imports or exports.

It is made unlawful for any person to export from the United States to any other state any arms or munitions without having first submitted to the board the name of the purchaser and the terms of sales, and without having obtained a license therefor.

PRESIDENT WARNS INDUSTRY TO KEEP STRATEGIC MATERIAL

President Roosevelt told newsmen last week the government has been informed foreigners are trying to buy strategic materials in the United States, these including ferromanganese, manganese ore, pig tin, chrome

Speed Production WITH Speed Nuts



Cut ASSEMBLY COSTS 50%

Mobilization of industry calls for greater speed and efficiency than we have ever before witnessed. Nothing can stand in the way of faster production and yet every part assembled to every product must be done better. Here SPEED NUTS do their part in amazing fashion.

Every SPEED NUT always takes the place of two parts and sometimes as many as 4 and 5 parts. SPEED NUTS are applied faster, they are lighter in weight and hold assembly parts together firmly for the life of the product. Made of high carbon spring steel properly heat treated. Produced for most standard sizes of machine screws, stove bolts, metal screws, rivets and plastic studs. Over 300 different shapes and sizes. Over 700 million in use. Write, now for samples, prices and details.

SPEED NUT DIVISION TINNERMAN STOVE & RANGE CO.
2039 FULTON ROAD, CLEVELAND, OHIO
Manufacturers of Patented SPEED NUTS

IN CANADA, WALLACE BARNES CO., LTD., HAMILTON, ONTARIO. IN ENGLAND, SIMMONDS AEROCESSORIES, LTD., LONDON.

ore, crude rubber, and similar materials.

Mr. Roosevelt called on owners of commercial stocks of these materials to refuse to sell to foreign buyers the material needed for this country's defense. He read a short memorandum prepared at the request of Secretary of War Woodring and Acting Secretary of the Navy Edison, and he felt, he said, that it would be sufficient at this time to call the policy to the attention of those in a position to control sales of these materials. A word to the wise should be sufficient, he said.

The Chief Executive was questioned by a correspondent as to whether he would resort to legislation if his plea for voluntary action in connection with these sales was not heeded. He did not answer the question. He declined to disclose the nationality of the foreigners he said are trying to purchase these materials.

COMMITTEE GATHERS DATA ON NATIONAL LABOR BOARD

Representative Howard W. Smith, Virginia, and his special house committee investigating the national labor relations board expect to open hearings early in November.

Committee, under the direction of Edmund M. Toland, general counsel, has sent out 60,000 questionnaires to employers and union organizations. These go into every phase of possible relationship between the NLRB, employers and unions, and Mr. Toland states the material contained in replies will go far toward achieving an analysis of the labor board's policies and activities. Replies will be tabulated and Mr. Toland hopes for some interesting results. The questionnaires contain over 100 questions.

Sent to Employers, Unions

High lights of the employer questionnaire:

Did the trial examiner direct the reporter to omit from the record any part of the proceedings?

Did he examine or cross-examine your witnesses? Or witnesses for NLRB? If so, to what extent?

Please furnish also whatever information you can on the attitude and conduct of the attorneys for NLRB before and during the hearing; the attitude and conduct of the trial examiner before and during the hearing and the cost of the hearing to your company, as well as the effect, if any, the results had upon your community.

In the questionnaire to the unions the committee asks, among other things:

What was the attitude generally or specifically of the board's representatives toward your organization or any affiliated union or organization or toward any of the charges filed or to be filed?

Have any activities of the board or policies of the board or its agencies and employes interfered with (or aided) your growth and functioning as a collective bargaining agency?

The house at the last session of congress appropriated $50,000 out of its contingent fund to finance the investigation.

WARNS OF DISLOCATIONS IN U. S. FOREIGN TRADE

Dislocations in America's foreign trade are foreseen by the foreign commerce committee of the chamber of commerce of the United States as a result of the war in Europe.

In a report to the chamber's board of directors, the committee cautions against too great expectations of increased trade with South America through the shutting off of German exports and from possible delays and declines in British shipments. It says:

"It is to be kept in mind that the financial situations in some of the South American countries has in the past resulted in the building up of great quantities of blocked funds. Also, the shutting off of South American exports to certain European states may increase the difficulties of some countries in meeting payments for their imports and returns on direct investments."

Committee points out some factors that may be expected to affect trade with foreign countries:

"The increase in war risks on all ocean routes brings a burden of additional costs on ocean carriers and cargoes.

"Normal commercial travel to and from Europe cannot be looked for, and this will have a serious effect upon the maintenance of close commercial contact between customers on the other side of the Atlantic and their suppliers or buyers here.

"As to direct investments in belligerent countries, it is important that the United States government and private groups examine into what action it is appropriate to take for their protection. Increased taxation, sure to accompany the war, will place in jeopardy not only accrued profits abroad, but in some instances capital investment as well.

"The United States intends to continue its foreign trade agreements policy. While the character of trade under existing agreements may be affected, basic principles seem assured of continuance."

American supplies of strategic war materials, the committee declares, must be carefully guarded, and sea lanes on which they are carried must be kept open.

Enlargement of the facilities of the export-import bank in co-operation with private banks, for the extension of assistance to exporters and importers in the field of intermediate and long-term credit, wherever justified, is recommended by the committee.

ITALY'S IRON ORE OUTPUT DWINDLES; SCRAP IMPORTS UP

Despite efforts being made in Italy to increase domestic production of iron ore and curtail imports of iron and steel scrap, output of iron ore has declined and imports of scrap have increased, according to a report from Consul Lester L. Schnare, Milan.

Italian iron ore production, including manganiferous ore, is shown to have declined from 1,016,027 metric tons in 1927 to 1,011,451 tons in 1938 and to have continued this trend in 1939 when five months' output of 353,358 tons was short of the 461,380 tons reported mined in the comparable period of 1938.

Manganiferous ore production, reported separately in 1939 for the first time, amounted to 4120 tons against 7427 tons in the preceding year. Output of pyrites displayed an opposite trend, increasing to 417,538 tons from the 1938 figure of 397,018 tons.

Italian imports of iron and steel scrap, the report shows, increased from 537,000 tons in 1937 to 601,000 tons in 1938. The increase over the first half of 1939 as compared with the corresponding period of 1938 was considerably more marked, the total for the earlier period having been recorded at 271,848 tons and that for the later at 384,475 tons.

GERMANY FAILS TO FILL CHILEAN RAILROAD ORDERS

Large orders for railroad equipment placed with Germany in December, 1937, by the Chilean state railways have not yet been delivered, according to a report from the American commercial attache at Santiago.

Orders called for 16 three-car articulated trains, 3 electric locomotives and other equipment amounting to $3,273,397 in United States currency. Eleven trains were to have been electric and 4 diesel electric. The Calera-Valparaiso run was scheduled to receive 7 of the new units, 4 were scheduled for service between Santiago and San Antonio, and 4 between Santiago and Puerto Montt.

According to the report the purchases were not made to facilitate co-ordination with highway transport nor primarily to meet that competition but rather to increase tourist travel to the south; electrify the San Antonio branch and decrease coal consumption because of the growing scarcity of that fuel; and to improve the Valparaiso commuting service.

AVIATION

NEW FACILITIES NEEDED AS AIR TRAFFIC, PROFITS GROW

■ HOW important passenger traffic has become on the nation's airways is reflected in plans announced recently by five leading airlines for constructing a Grand Central air terminal at Park avenue and Forty-second street, New York. Passengers will be transported by bus directly to the new $30,000,000 airport at North Beach. Completely air conditioned and equipped with escalators and automatic elevators, the new building will offer airline patrons the convenience of restaurants, shops and a newsreel theater. Project's director is to be the Charles F. Noyes Co., 225 Broadway, New York.

Air carriers currently are operating well in the black. For the first six months this year, 15 major lines show aggregate net earnings of $480,773. Of the 15, profits were recorded by 9, while 6 took losses. Marked improvement is indicated by estimates the same 15 firms will earn an aggregate $1,700,000 in the first eight months, only two being in the red.

All domestic airlines during the first half flew 278,353,321 revenue passenger miles, 34 per cent over the same period in 1938. August volume ran some 48 per cent ahead of last year.

With traffic gaining steadily many lines feel urgent need for additional transport equipment. Large orders have been booked recently by Douglas Aircraft Co. Inc., Santa Monica, Calif. Included: American Airlines, 20 DC-3 21-passenger transports, $2,400,000; Chicago & Southern Airlines, 6 DC-3s, $700,000; Braniff Airways, 4 DC-3s, $500,000; and Eastern Airlines, 3 DST sleeper planes, $350,000. Continental Airlines has just purchased two 11-passenger craft from Lockheed Aircraft Corp., Burbank, Calif.

See Expansion Impetus

Expansion of aircraft plants is expected to be considerably accelerated by the treasury department's recent liberalization of profit limitations on aeronautical contracts. Under the Vinson-Trammell act profits on military plane and engine orders are limited to 12 per cent with a 5-year carryover. By its new formula the treasury may agree before completion of an order to permit the contractor to charge against his profits a fixed part of the cost of any special facilities required for the government work. It must be certified that such special facilities are necessary for the national defense program and that due to technical considerations they will be partially or totally useless after the contract's completion.

Work recently was started by Magnesium Fabricators Inc. on an addition which will quadruple its Adrian, Mich., plant. H. E. Emery, president, states the new unit is necessitated by greatly increased demand for the company's magnesium products for airplanes and automobiles.

Bids now are being taken by Akron Aircraft Inc., Akron, O., for construction of an assembly plant to cost more than $40,000. North American Aviation Inc. has awarded contracts for a 200,000-square foot factory unit at Inglewood, Calif.

Aircraft Accessories Corp., Glendale, Calif., recently filed with SEC its intention to issue stock realizing $150,000. Proceeds are allotted for new buildings, machinery and equipment, and product development.

Employment continues to gain steadily in the industry. Vought-Sikorsky division of United Aircraft, Stratford, Conn., holding large navy contracts, announces it is adding 800 men to the 1100 already on its factory payroll.

Engines Ordered by Navy

Navy department last week awarded to Pratt & Whitney division of United Aircraft, East Hartford, Conn., a contract for engines and spare parts costing $348,227. Army air corps is reported preparing to buy from Stearman division of Boeing Airplane Co., Wichita, Kans., several hundred primary training planes amounting to some $3,000,000.

New cabin monoplane of spot-welded stainless steel has been developed by William B. Stout, president, Stout Engineering Laboratory Inc., Dearborn, Mich. Past president, Society of Automotive Engineers, and designer of the first all-metal plane, Stout plans low-cost quantity production of this latest craft. Weighing about 750 pounds, ship is powered with a 70-horsepower air-cooled pusher engine.

Correcting Propeller Blade Angles

■ **Special equipment in great variety has been developed for airline maintenance bases and repair shops. Pan American Airways uses this workbench and precision jig in setting propeller blades to correct angles**

River Shipments Gain

■ August river shipments in the Pittsburgh district increased in aggregate over July to a new high for the year despite a slight decline in Allegheny river tonnage. Iron and steel products gained substantially, with movement on the Ohio river approaching an all-time peak. Comparisons:

Steel Products

	August 1939	July 1939	August 1938
Allegheny	4,300	2,900	3,300
Monongahela .	89,500	68,000	49,200
Ohio	152,300	131,200	109,000

All Products

	August 1939	July 1939	August 1938
Allegheny ..	233,500	241,900	263,300
Monongahela	1,949,300	1,703,500	1,279,470
Ohio	1,411,000	1,400,400	885,650

HYATTS ARE *Right* IN THE CENTER OF ACTION

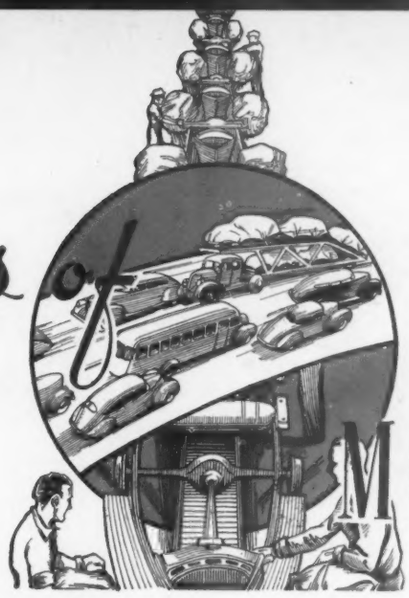
Specify Hyatt Roller Bearings for your new equipment—use them for change-overs on existing equipment. Let us furnish further details.

HYATT ROLLER BEARINGS

ACTION *CENTERS* AT THE BEARING POINTS, where power meets load—where you must guard against friction, waste, wear, maintenance, replacements, shut-downs. And here, where the battle for efficiency is fought, Hyatt Roller Bearings are used with the utmost of confidence.

Confidence enriched by years of successful experience with these better bearings...confidence in correct bearing design, precision manufacture, sturdy construction, and sound application...confidence that in the centers of action Hyatts will always serve well and long. Hyatt Bearings Division, General Motors Sales Corporation, Harrison, N. J., Chicago, Pittsburgh, Detroit and San Francisco.

Mirrors of MOTORDOM



By A. H. ALLEN
Detroit Editor, STEEL

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DETROIT

■ TREMENDOUS wave of buying which has engulfed sales offices in this territory since the outbreak of war in Europe has three major elements—mass buying hysteria which has swept the country in recent weeks, efforts to hedge against possible price increases after the first of the year, and a desire to repair inventories which have been in sadly depleted condition in the face of hand-to-mouth buying of the past 18 months.

In Detroit, the second of these elements probably is most predominant. Motor companies, many of which already have announced reductions in sales prices of 1940 models, find themselves out on a limb as a result of sudden firming of steel and metal prices. Most large users are protected through the balance of this year at prices previously prevailing, but after that it is anyone's guess.

Partsmakers Storing Steel

Parts suppliers, some selling below cost in the face of destructive competition in recent years, now are determined to get on a cost-plus-profit basis, and there is no alternative but to charge motor companies more. Further, the parts people themselves are faced with the prospect of paying more for steel after Jan. 1 and they have already loaded their warehouses and storage spaces to the gunwales with steel, some even storing material in the open.

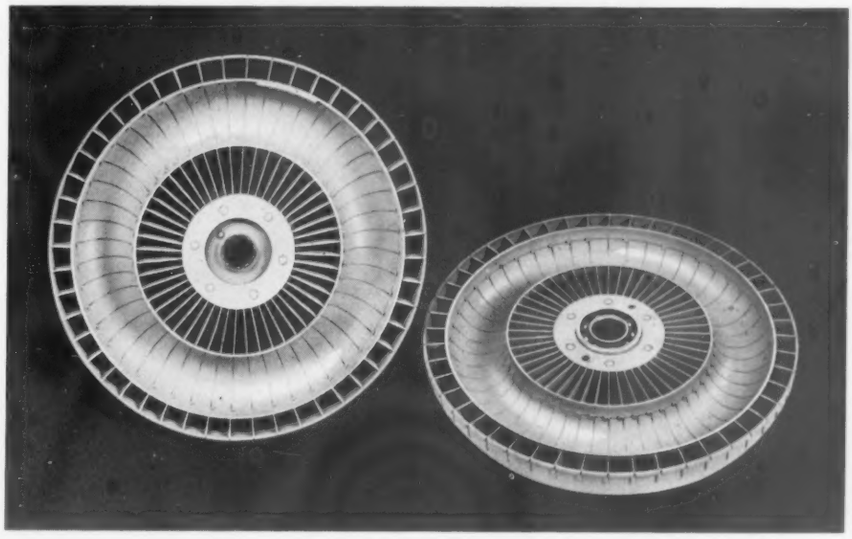
In the face of this situation it is easy to see why motor companies are projecting their schedules well into next spring and are trying to get coverage on supplies anywhere from three to six months ahead.

One supplier of bolts and screws here said that if present demands for material could be satisfied, it would mean operating his plants day and night until January, 1942. Patently, some customers are going to have to take less than they have asked for, and it is a ticklish job for suppliers to determine just how far they can go in meeting demands of various customers. And they must also keep in mind the disastrous effects which doubtlessly would result from a sudden cessation of hostilities abroad. Cancellations, hold-ups and postponements would flock in and the resultant critical situation among suppliers would be dangerous to many.

One of the leading motor manufacturers is issuing instructions for suppliers to cover on steel and metal up to April 1, 1940, volume based on seven to eight times September production. In one case at least, this interest has offered to make good on steel costs should any readjustment be necessary on releases in the next six months. Under this arrangement, the supplier in question is inclined to go ahead, in the belief that assured purchases of this quantity of material will permit adjusting manufacturing schedules to a nice balance and will avoid serious swings in employment.

Another automobile company affiliate actually has placed orders for

Rotors in Oldsmobile's New Hydra-Matic Drive



■ **Rotor elements in the liquid flywheel of the new "hydra-matic" drive being introduced by Oldsmobile as optional equipment on 1940 models. The two rotors, with 48 vanes each, are mounted inside a housing into which oil is pumped from the transmission under 30 pounds pressure. Power is transmitted from the engine to the transmission through the liquid flywheel due to the centrifugal force of oil thrown by vanes of the driver rotor against vanes of the driven rotor**

material required in anticipated production up to April 1, 1940. This is a radical departure from practice last year when releases were made monthly.

In any period like the present, there is always the tendency to look over inventories and bolster them where weakness might be apparent. This policy is being pursued by a large number of smaller manufacturers, and is one reason why the pressure on steel companies for shipments has been so acute. In turn it has meant difficulties for those manufacturers who have been buying on a hand-to-mouth basis and suddenly find production has caught up to raw material in stock.

Any delay in shipping steel to such companies is translated immediately into delays in production, and more than one general manager has had to hop on the long-distance telephone and plead with material sources for prompt shipment of orders. While suppliers naturally regret such a turn of events, there is increasing disposition to lay the blame at the door of a short-sighted buying policy rather than at the inability of the supplier to make deliveries.

After all, a large steel company, with an order department two weeks behind in transferring incoming business to production schedules, cannot be expected to commiserate too deeply with a manufacturer who has used up his last carload of steel and has to lay off his force until another car arrives.

■ WITHIN a week or so, news of what Ford will offer for 1940 can be expected. Meanwhile, advance information is meager. This much is known, however: Ford will feature an entirely new type of ride for next year, which experts declare will overcome what objections have been lodged against the continued use of transverse springs.

This type of spring still will be used, but springs themselves will be much softer, longer, and detached from their function of maintaining the car level. Levelators or stabilators, operating in conjunction with new type leakproof shock absorbers, will assume the duty of keeping the car level, permitting the softer springs to give enhanced riding qualities.

Shock absorbers have been used in previous models, of course, but they have had a tendency to become harsh in action where fluid has leaked from them. The new design is said to overcome the possibility of leaks altogether.

An entirely new version of the Lincoln Zephyr is expected, an estimated $2,000,000 having been expended on tools and dies for this series. For 1940, the Zephyr likely will encounter some stiff competition from the General Motors cars featuring the new Fisher Torpedo body. Buick, Pontiac, Olds, Cadillac and La Salle all have models with this new type of body, and at least the Buick, Pontiac and Olds versions are predicted by some as aiming at the Zephyr class of buyers.

Buick, incidentally, last week reported the largest bank of unfilled retail orders—19,509 on Sept. 20—ever recorded by this division. These were said to represent customer orders in the hands of dealers for which deposits or trade-ins have been taken. They were three times the number on hand at the same time last year.

Deliveries during the 10-day period prior to Sept. 20, and previous to announcement date, totaled 3448 units, compared with 1177 in the previous ten days and with 1742 in the corresponding period last year. Current deliveries are affected by the extent of dealers' initial stocks and the fact retail deliveries of 1940 models did not start until Sept. 15.

Last Friday, Alfred P. Sloan Jr., chairman of General Motors, delivered a message to all the corporation's dealers in which he outlined the plan for a major step by the corporation in improving the ethics of automobile merchandising by eliminating certain undesirable practices. Effective at once, all new cars will carry a tag on the steering wheel giving the price at the point of manufacture, rail transportation charges to the point of sale, local taxes if any and charges for optional equipment.

The first of these items, or "factory" price will be uniform throughout the country except where local regulations require modification, and will include (1) cost of producing the car plus manufacturer's profit; (2) essential expenses of dealer in preparing car for delivery (handling charges); (3) allowance for the expense of merchandising with the essential profit for the dealer; and (4) reimbursement to the manufacturer of special taxes levied against him.

Promoting New Policy

Dealer contracts are being amended to cover this method of pricing, wall charts will be distributed to dealers explaining the plan and an advertising campaign covering the broad principles of the idea will be launched. As a further adjunct, dealers will be asked to provide buyers with itemized invoices on new cars, showing just what the buyer is paying for.

The plan appears to be a commendable move to clear up malpractices on car pricing in some localities, as well as to vitiate steps which might be taken by consumer organizations or federal agencies which might lead to governmental control of automobile merchandising. It might be pointed out that the formula, establishing the mark-up between the factory-delivered price and the consumer price, and indicating the maximum price to be charged buyers, was developed by the auto industry in complete cooperation with the federal trade commission.

Other units in the industry subsequently may offer other versions of the formula, but, as Mr. Sloan pointed out, it is hoped that the "economic soundness, commercial justification and fairness to all groups in the industry, will result in a determined effort by the entire industry to eliminate inequitable practices."

■ A FEW details of the new hydraulic and automatic transmission being built by the Detroit transmission division of General Motors have been announced by Oldsmobile which will offer the transmission

(*Please turn to Page* 48)

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1937	1938	1939
Jan.	399,186	226,952	356,950
Feb.	383,900	202,597	317,517
March	519,022	238,447	389,489
April	553,231	237,929	354,263
May	540,377	210,174	313,214
June	521,153	189,402	324,235
July	456,909	150,450	218,478
Aug.	405,072	96,946	‡103,343
8 mos.	3,778,850	1,552,897	2,377,489
Sept.	175,630	89,623	.....
Oct.	337,979	215,286	.....
Nov.	376,629	390,405	.....
Dec.	347,349	406,960	.....
Year	5,016,437	2,655,171	.....

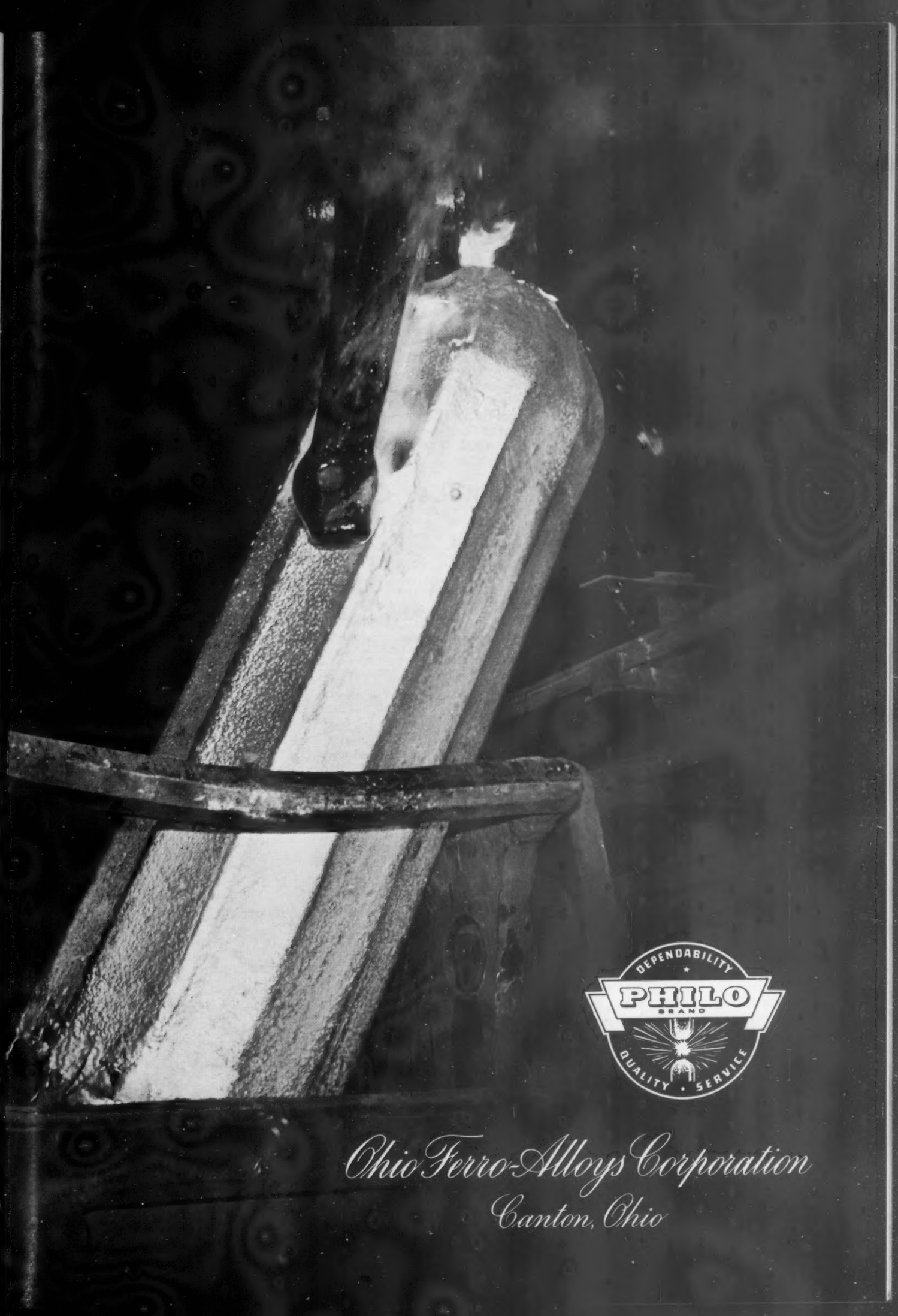
‡Revised.

Estimated by *Ward's Reports*

Week ended:	1939	1938†
Sept. 2	25,240	22,165
Sept. 9	26,865	17,485
Sept. 16	41,245	16,100
Sept. 23	53,950	20,390
Sept. 30	62,755	25,405

†Comparable week.

	Week Ended Sept. 30	Sept. 23
General Motors	17,550	16,900
Chrysler	21,975	21,100
Ford	9,240	1,950
All others	13,990	14,000



Ohio Ferro-Alloys Corporation

Canton, Ohio

MEETINGS

GEARMAKERS COMPLETING PROGRAM FOR OCT. 16-18

■ S. WELLS UTLEY, president, Detroit Steel Casting Co., Detroit, will address the American Gear Manufacturers' association at the dinner during its semiannual meeting at Whitcomb Sulphur Springs, St. Joseph, Mich., Oct. 16-18. His subject will be: "Industry's Contribution to Civilization."

Technical papers to be presented include: "Superfinishes," by John Hutchinson, Chrysler Corp., Detroit; "Experiences in the Gear Industry," by U. Seth Eberhardt, Newark Gear Cutting Machine Co., Newark, N. J.; "Cost Determination Is Not a Mystery," by Paul Christensen, Cincinnati Gear Co., Cincinnati; "Modern Trends in Nickel Steel and Cast Iron Materials," by C. M. Schwitter, International Nickel Co. Inc., New York; "Noise," by Prof. F. A. Firestone, University of Michigan, Ann Arbor, Mich.; and "Gear Grinding," by John Dixon, Pratt & Whitney Co., Hartford, Conn.

Special reports will be made as follows: "Inspection Tolerances for Gears," by Granger Davenport, Gould & Eberhardt Co., Newark, N. J.; "Proportions of Industrial Gears," by W. P. Schmitter, Falk Corp., Milwaukee; and "Specifications for Gear Lubricants," by H. A. McConville, General Electric Co., Schenectady, N. Y.

TOOL ENGINEERS' PROGRAM HAS BEARINGS SYMPOSIUM

A variety of inspection trips to metalworking plants, a dinner and symposium on machine tool bearings will feature the semiannual meeting of the American Society of Tool Engineers at Hotel Statler, Cleveland, Oct. 6-7. First day will be occupied with plant visits. At the dinner in the evening, John M. Younger, professor of industrial engineering, Ohio State university, Columbus, will present the second report of the fact-finding committee on "Effect of Development of the Machine on Employment and Standard of Living"; and Hamilton Fish, congressman from New York, will speak on "Economic and Political Effect of Development of the Machine."

Papers scheduled for the bearings symposium on the morning of Oct. 7 are: "Application and Use of Antifriction Bearings as Applied to Machine Tools," by Stanley R. Thomas, chief engineer, Bantam Bearings Corp., South Bend, Ind.; "Application and Use of Plain Bearings as Applied to Machine Tools," by Eugene Bouton, supervisor of time study, J. I. Case Tractor Works, Racine, Wis.; and "Bearings—Their Use and Misuse," by Karl L. Hermann, engineer, South Bend, Ind. S. L. Crawshaw, application engineer, Nutall works, Westinghouse Electric & Mfg. Co., Pittsburgh, will contribute discussion.

FOUNDRY EQUIPMENT GROUP WILL STUDY WAR DEMAND

Annual meeting of the Foundry Equipment Manufacturers' association at the Greenbrier hotel, White Sulphur Springs, W. Va., Oct. 6-7, will include one session on the part equipment industries may be expected to play in the present war situation. Discussion at this session will center on the business situation, labor supply, raw materials and mobilization of the industry's strength.

James R. Allen, International Harvester Co., Chicago, and chairman of the American Foundrymen's association hygiene codes committee, will discuss phases of the dust hazard with particular reference to elimination equipment used in foundries. W. R. Bean, vice president, Whiting Corp., Harvey, Ill., will speak at the dinner on Oct. 6 on "Prewar Conditions in England and Europe."

All manufacturers of equipment used in foundries are invited to attend the meeting.

CASE PRESIDENT TO SPEAK AT ENAMELISTS' FORUM

Dr. William E. Wickenden, president, Case School of Applied Science, Cleveland, will be principal speaker at the banquet during the fourth annual Porcelain Enamel institute forum at the Deshler-Wallick hotel, Columbus, O., Oct. 18-20 (STEEL, Sept. 25, p. 35). The banquet will be held Oct. 19.

October Convention Calendar

Oct. 2-3—Eleventh Boston Conference on Distribution. Hotel Statler, Boston. Daniel Bloomfield, 80 Federal street, Boston, is director.

Oct. 2-4—Farm Equipment institute. Forty-sixth annual meeting at French Lick Springs hotel, French Lick, Ind. Robert A. Jones, 608 South Dearborn street, Chicago, is secretary.

Oct. 5—Associated Machine Tool Dealers of America. Annual convention at Hotel Cleveland, Cleveland. Thomas A. Fernley, 505 Arch street, Philadelphia, is executive secretary.

Oct. 5-6—Central Supply association. Annual meeting at Palmer House, Chicago, W. E. McCollum, 228 North LaSalle street, Chicago, is secretary.

Oct. 5-7—American Institute of Mining and Metallurgical Engineers and American Society of Mechanical Engineers. Joint conference on coal at Deshler-Wallick hotel, Columbus, O.

Oct. 5-7—Society for the Advancement of Management. Annual conference at Hotel New Yorker, New York. E. Buckley, 29 West Thirty-ninth street, New York, is executive secretary.

Oct. 5-7—Society of Automotive Engineers. National aircraft production meeting at Hotel Biltmore, Los Angeles. John A. C. Warner, 29 West Thirty-ninth street, New York, is secretary.

Oct. 6-7—Foundry Equipment Manufacturers' association. Annual meeting at Greenbrier hotel, White Sulphur Springs, W. Va. Arthur J. Tuscany, 632 Penton building, Cleveland, is executive secretary.

Oct. 9-12—American Gas association. Twenty-first annual convention at Hotel Pennsylvania, New York. Kurwin R. Boyes, 420 Lexington avenue, New York, is secretary.

Oct. 15-17—National Association of Waste Material Dealers. Fall meeting at Lord Baltimore hotel, Baltimore. Charles M. Haskins, 1109 Times building, New York, is secretary.

Oct. 16—Society of Automotive Engineers. Annual dinner at Hotel Pennsylvania, New York. John A. C. Warner, 29 West Thirty-ninth street, New York, is secretary.

Oct. 16-18—American Gear Manufacturers' association. Twenty-second semiannual meeting at Whitcomb Sulphur Springs, St. Joseph, Mich. J. C. McQuiston, 701 Shields building, Wilkinsburg, Pa., is secretary-manager.

Oct. 16-19—American Hardware Manufacturers' association. Semiannual convention at Marlborough-Blenheim hotel, Atlantic City, N. J. Charles F. Rockwell, 342 Madison avenue, New York, is secretary.

Oct. 16-19—National Wholesale Hardware association. Forty-fifth annual convention at Marlborough-Blenheim hotel, Atlantic City, N. J. George A. Fernley, 505 Arch street, Philadelphia, is secretary.

Oct. 16-20—National Safety council. Twenty-eighth national safety congress in Atlantic City, N. J. William H. Cameron, 20 North Wacker drive, Chicago, is managing director.

Oct. 17—National Association of Sheet Metal Distributors. Annual meeting at Marlborough-Blenheim hotel, Atlantic City, N. J. George A. Fernley, 505 Arch street, Philadelphia, is secretary.

Oct. 17-18—American Institute of Steel Construction. Seventeenth annual convention at Waldorf-Astoria hotel, New York. V. Gilmore Iden, 101 Park avenue, New York, is secretary.

Oct. 18-20—Porcelain Enamel institute. Fourth annual forum at Deshler-Wallick hotel, Columbus, O. Charles S. Pearce, 612 North Michigan avenue, Chicago, is secretary.

Oct. 23-25—American Institute of Mining and Metallurgical Engineers. Fall meetings of Iron and Steel and Institute of Metals divisions at Blackstone hotel, Chicago. Louis Jordan, 29 West Thirty-ninth street, New York, is assistant secretary.

Oct. 23-27—American Society for Metals. Twenty-first national metal congress and exposition at Palmer House, Chicago. William H. Eisenman, 7016 Euclid avenue, Cleveland, is secretary.

Oct. 23-27—American Welding society. Twentieth annual meeting at Stevens hotel, Chicago. M. M. Kelly, 33 West Thirty-ninth street, New York, is secretary.

Oct. 23-27—Wire association. Annual meeting at Congress hotel, Chicago. Richard E. Brown, 300 Main street, Stamford, Conn., is executive secretary.

Activities of Steel Users, Makers

■ DETROIT BALL BEARING CO., Detroit, announces opening of a branch in Grand Rapids, Mich., to handle Timken, Hyatt, New Departure, Fafnir, Norma bearings. Will C. Thompson is manager.

♦

Hughes Tool Co., Houston, Tex., has purchased former plant of Continental Supply Co., in Houston, comprising two warehouses, loading dock and garage, block and a half of land.

♦

Wood Preserving Corp., subsidiary Koppers Co., Pittsburgh, has acquired railroad cross tie, other forest products business of B. Johnson & Son, Richmond, Ind. B. N. Johnson, Richmond, and R. H. Johnson, Little Rock, Ark., will become associated with Wood Preserving Corp.

♦

Taylor-Winfield Corp., Warren, O., has opened a New England district sales office, 623 State Mutual building, Worcester, Mass. V. Wayne Green will handle sales of its resistance welding equipment.

♦

Martin Electric Co., Detroit, has moved into its new plant on Outer Drive, Detroit. Space vacated at former Piquette avenue plant has been taken by Progressive Welder Co.

♦

Divco-Twin Truck Co., Detroit, announces opening of new plant for production of house-to-house delivery vehicles. Buildings provide 150,000 square feet of floor area, including manufacturing space, stockrooms and office facilities. Plant will have a capacity of 5000 units annually.

♦

Putnam Tool Co., Detroit, has completed new plant addition, to house a portion of milling and turning department.

♦

General Plastics Inc., North Tonawanda, N. Y., announces its business hereafter will be conducted under the firm name of Durez Plastics & Chemicals Inc.

♦

Construction Machinery & Supply Co., 617 State street, Toledo, O., has been appointed distributor of Rex construction machinery in the Toledo area by Chain Belt Co., Milwaukee. Equipment handled by the firm includes pavers, mixers, centrifugal pumps, plaster and motor mixers, cold patch mixers, diaphragm pumps.

♦

Rapids Mfg. Co., Grand Rapids, Mich., has merged with Standard Casters Co., Manistee, Mich., to form The Rapids-Standard Co. Equipment manufactured includes portable power and gravity conveyors, factory trucks, forged steel casters, industrial metal and rubber wheels. Plant will be located in Grand Rapids.

♦

F. G. Dunbar & Son, 53 West Jackson boulevard, Chicago, have been appointed exclusive sales representative for the Chicago territory of Tate-Jones & Co. Inc., Leetsdale, Pa. The firm will handle sales of oil and gas burners for furnaces and boilers, oil heaters and strainers, pumping systems, blast gates, blowers, heat treating and forging furnaces, automatic control equipment. H. P. Rasmussen formerly represented Tate-Jones in the Chicago area.

♦

Pittsburgh Plate Glass Co., Pittsburgh, opened warehouse for paint, glass stocks, to serve lower Rio Grande valley, at Corpus Christi, Tex., Oct. 2.

♦

Spencer & Morris have moved production facilities into a new steel building at 5649 Alhambra avenue, Los Angeles. The company specializes in sale, installation of handling equipment. It is California and Arizona representative for Cleveland Crane & Engineering Co., Wickliffe, O., and its Cleveland Tramrail division. The new building is 40 x 75 feet, on a site which allows for future expansion.

♦

Food Machinery Corp., Los Angeles, has purchased Kimball-Krogh Pump Co., Los Angeles, division of Victor Equipment Co., San Francisco. Already pumping equipment manufacturers, through their Peerless Pump division, Food Machinery Corp. will merge Kimball-Krogh into another pump manufacturing unit. Victor Equipment Co. will concentrate on development, sale of Victor welding products.

♦

Fray - Mershon Inc., Glendale, Calif., announces all future advertising, merchandising of "All Angle" full universal milling machines and vises will be done under the name of Fray Machine & Tool Co., Glendale, Calif. Sporting goods products, firearms accessories manufacturers, distributors, Fray-Mershon Inc. henceforth will concentrate on those activities, and will retire from manufacturing, merchandising of power, bench tools.

♦

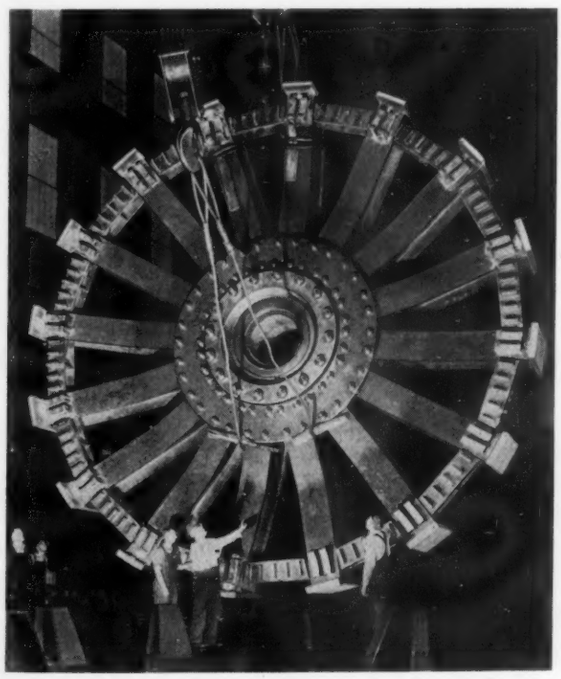
Coast Metals Inc., Canton, O., announces appointment through Universal Power Corp., Cleveland, of the following representatives for the sale of Coast metal, a hard surfacing abrasion resisting weld metal. Eugene Beeler, Arc Welding Co., Columbus, O.; John L. Brown, Ft. Wayne, Ind.; Snyder Bentley Co., Youngstown, O.; Welder Service Co., Toledo, O.

♦

Webster Mfg. Co. Inc., maker of materials handling equipment, Tiffin, O., has appointed Fessler & Co., Pittsburgh, its sales agent in that territory.

♦

Progressive Welder Co., Detroit, has appointed R. C. Neal Co., Buffalo, distributor for its welding machines and equipment in the Buffalo area, comprising northwestern New York state and northeastern Pennsylvania counties.



Steel Spider 82 Tons

■ **Rotor spider 27 feet 2 inches in diameter, weighing 82 tons, being turned over for further machining in West Allis, Wis., shops of Allis-Chalmers Mfg. Co. It is for one of three 30,000-kilovolt-ampere, 13,800-volt waterwheel generators for Chickamauga dam, Tennessee valley authority. Arms are welded steel plates, hub a solid steel forging**

Editorial

Tractors and the Farm Policy

■ IMPORTANT improvements have been made of late in agricultural implements and machinery. Modern tractors are displacing farm draft animals more rapidly. Economists who discuss this phenomenon fear that this trend will further degrade the position of agriculture. They point out that where the farm animal subsists on farm produce, including a large percentage of farm wastes, the tractor-owning farmer must buy gasoline or fuel oil. They point out that where the farm animal is a source of free fertilizer, this is not an end product of the tractor. They reason that this situation raises the farmer's production cost at the same time that it makes for larger crops, thus leading to depressed prices.

This reasoning seems substantially correct on the basis of the present national policy in respect to agriculture. This, in effect, penalizes farm efficiency. For any attempt by the farmer to become a more efficient producer clashes directly with the public policy of seeking to elevate prices on farm products by keeping down the size of the crop.

Tractor One Element in Efficiency Which Should Be Aim of Farm Policy

But the farmer is right when he buys a tractor. He is acting in accordance with a concept whose soundness has been demonstrated. Industry is successful to the extent that it manufactures goods that the people want in volume, and to the extent that it is able to sell at prices the people can afford to pay. It should be clear that no public agricultural policy can be successful in the long run unless aimed at encouraging the farmer to be efficient, to produce in large volume, in improved quality, and to sell at the lowest prices consistent with earning a reasonable profit for his efforts.

Such a national policy would stimulate agriculture immensely if the conception of the farm as a source of foodstuffs and such materials as cotton, wool, hides, drugs, turpentine, wood and broomstraw were enlarged radically. The farm is a potential vast source of many materials which are being used or could be used on a large scale in many manufacturing processes. The modern chemist understands that this is true. He can paint a picture of general prosperity based on agricultural potentialities. These include the wide use of alcohol as an admixture with gasoline in motor fuel, the development of fireproof building materials from organic fibers, the large-scale use of plastics of organic origin and many others.

Stimulating Agriculture by Sound Methods Would Benefit all Industry

A national policy aimed at assisting agriculture on this basis would prove a real and lasting stimulus to industry. It would bring a huge demand for distilling, refining and other processing plants on the order, for example, of the papermaking industry now being built on a large scale in the South, on the basis of the young Southern pine.

Yes, such a national policy of stimulating agriculture would have certain repercussions in the field of industry. But these should be of minor consequence, for industrial management is flexible and quick to adapt itself to changing conditions. From an overall point of view, a national policy of stimulating agriculture along sound lines not only would resuscitate agriculture but would yield vast benefits to the nation as a whole.

The BUSINESS TREND

Activity Index Approaches Recovery Levels of 1937

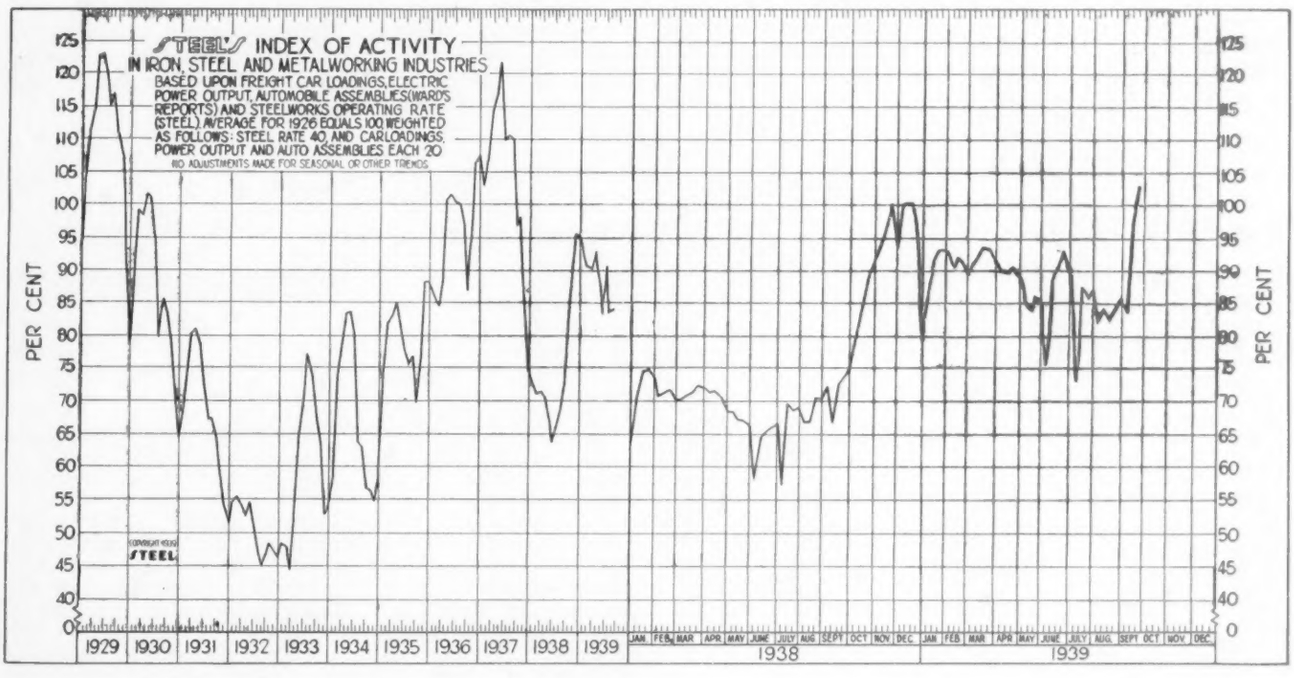
■ THE rising tide of industrial activity gathered increased momentum the last few weeks with manufacturers in all lines reporting an extensive backlog of orders, in some instances sufficient to maintain peak operations through the remainder of the year. No noticeable abatement in the intensity of demand has developed. Some consumers are seeking protection through the first quarter of next year.

Undoubtedly the European war has played an important part in stimulating domestic industrial activity. Purchasing agents throughout the country are making determined efforts to hedge against the anticipated rise in prices and to bolster inventories before their suppliers become tied up with probable foreign orders expected to materialize within the next six months.

However, it must be kept in mind that domestic business had been making good contra-seasonal gains throughout the summer and to a considerable degree the present level of business activity would have been maintained by the sound fall upturn even if war had not started in Europe.

Reflecting the sharp rise in activity during recent weeks in the iron, steel and metal working industries, STEEL'S index rose from 83.7 recorded during Labor Day week to 103.0 for the week ended Sept. 23. This represents a gain of 19.3 points, and there are good indications that the index will continue this upward movement through the weeks immediately ahead. The index is now at the highest level since the week ended Sept. 4, 1937.

Steelmaking operations touched a new high for the


STEEL'S INDEX OF ACTIVITY
IN IRON, STEEL AND METALWORKING INDUSTRIES
BASED UPON FREIGHT CAR LOADINGS, ELECTRIC POWER OUTPUT, AUTOMOBILE ASSEMBLIES (WARD'S REPORTS) AND STEELWORKS OPERATING RATE (STEEL). AVERAGE FOR 1926 EQUALS 100. WEIGHTED AS FOLLOWS: STEEL RATE 40, AND CARLOADINGS, POWER OUTPUT AND AUTO ASSEMBLIES EACH 20
NO ADJUSTMENTS MADE FOR SEASONAL OR OTHER TRENDS
PER CENT
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939
1938
1939

STEEL'S index of activity advanced 5.5 points to 103.0 in the week ended Sept. 23

Week ending	1939	1938
July 8	73.4	57.1
July 15	87.8	69.9
July 22	86.0	68.7
July 29	86.8	69.0
Aug. 5	83.5	66.9
Aug. 12	83.9	66.9
Aug. 19	82.2	70.5
Aug. 26	83.4	70.3
Sept. 2	86.3	72.3
Sept. 9	83.7	66.8
Sept. 16	97.5	72.9
Sept. 23	103.0	74.0

Mo. Data	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
Jan.	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1	87.6	104.1
Feb.	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5	99.2	111.2
March	92.6	71.2	114.4	88.7	83.1	78.9	44.5	54.2	80.4	98.6	114.0
April	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0	101.7	122.5
May	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6	101.2	122.9
June	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1	95.8	120.3
July	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3	79.9	115.2
Aug.	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4	85.4	116.9
Sept.	...	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7	110.8
Oct.	....	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2	78.8	107.1
Nov.	....	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4	71.0	92.2
Dec.	....	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3	64.3	78.3

year during the week ended Sept. 23 and further gains were recorded last week to bring the national steel rate to the highest level since the week ended Aug. 7, 1937. The current level of steelworks operations is approximately 84 per cent, representing a gain of 22 points in the short period since Labor Day week. A year ago the steel rate stood at 48 per cent.

The automotive industry seems well embarked on the fall production cycle, with assembly schedules in virtually all plants being stepped-up on 1940 models. Output during the week ended Sept. 23 advanced to 53,950, more than double that produced in the corresponding week last year and well ahead of the 41,245 cars assembled in the preceding week.

Reflecting the completion of 1939 model assemblies and the change over to the new models, automobile production during August declined to the low point of the year. Assemblies in that period totaled 103,343 units, compared with 218,478 during July and 96,946 in August, 1938. For the first eight months this year production totaled 2,377,489 units, against 1,552,897 in the comparable 1938 period.

Electric power consumption forged ahead to a new all-time peak of 2,448,888,000 kilowatt-hours during the week ended Sept. 23. This represents an increase of 13.7 per cent over the 2,154,218,000 kilowatt-hours recorded in the corresponding week last year. In the previous week power output totaled 2,444,371,000 kilowatt-hours, a gain of 10.4 per cent over the same week a year ago.

Revenue freight carloadings was another important business indicator to touch a new 1938 high during the week ended Sept. 23. Freight traffic in that week totaled 814,828 cars, compared with 805,733 in the previous week and 675,553 in the corresponding 1938 period. The sharp gains recorded in carloadings this month and more particularly the prospect of continued improvement has led many carriers to enter the market for extensive car repair programs and purchase of additional freight cars.

The return of many thousands to the ranks of the employed, particularly in the heavy industries, attests to the sharp improvement in industrial activity. The increased purchasing power resulting should further fortify the recovery movement now under way.

Where Business Stands

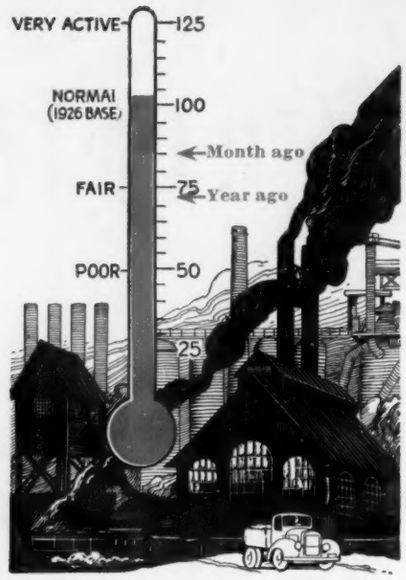
Monthly Averages, 1938 = 100

	Aug., 1939	July, 1939	Aug., 1938
Steel Ingot Output	154.2	139.9	104.3
Pig Iron Output	165.8	146.8	93.2
Freight Movement	118.8	113.7	106.1
Automobile Production	46.7	89.4	43.8
Building Construction	117.2	112.5	117.5
Wholesale Prices	95.3	97.3	99.6

Industrial Weather

TREND:

Upward



The Barometer of Business

Industrial Indicators

	Aug., 1939	July, 1939	Aug., 1938
Pig iron output (daily average, tons)	85,823	76,001	48,242
Machine tool orders index	206.5	230.9	120.9
3 Months' moving ave.	216.3	220.8	93.6
Foundry equipment new order index	131.4	111.9	83.3
Finished steel shipments	803,822	676,309	558,634
Ingot output (daily average, tons)	139,397	126,501	94,333
Nat'l Ind. Conference board inventory indices:†			
Raw materials	94.0	94.6	111.6
Semifinished goods	111.1	112.4	118.1
Finished goods	110.3	109.5	112.6
Dodge buildings awards in 37 states (sq. ft.)	$312,328,000	$299,883,000	$313,141,000
Automobile output	103,343	218,478	96,946
Coal output (tons)	34,470,000	29,135,000	28,665,000
Business failures: number	859	917	1,015
Business failures: liabilities	$11,259,000	$14,150,000	$16,382,000
Nat'l Ind. Conf. board (25 industries, factory):			
Av. wkly. hrs. per worker	37.2	37.2	33.8
Av weekly earnings	$26.76	$26.79	$23.93
Cement production (bbls.)	†12,644,000	11,953,000	10,968,000
Cotton consumption (bales)	628,448	521,405	561,000
Car loadings (weekly av.)	682,182	652,910	608,016

†July, June and July, respectively.

Foreign Trade

	July, 1939	June, 1939	July, 1938
Exports	$229,628,000	$236,059,000	$227,780,000
Imports	$168,925,000	$178,921,000	$140,836,000
Gold exports	$9,000	$19,000	$65,000
Gold imports	$278,645,000	$240,450,000	$63,880,000

Financial Indicators

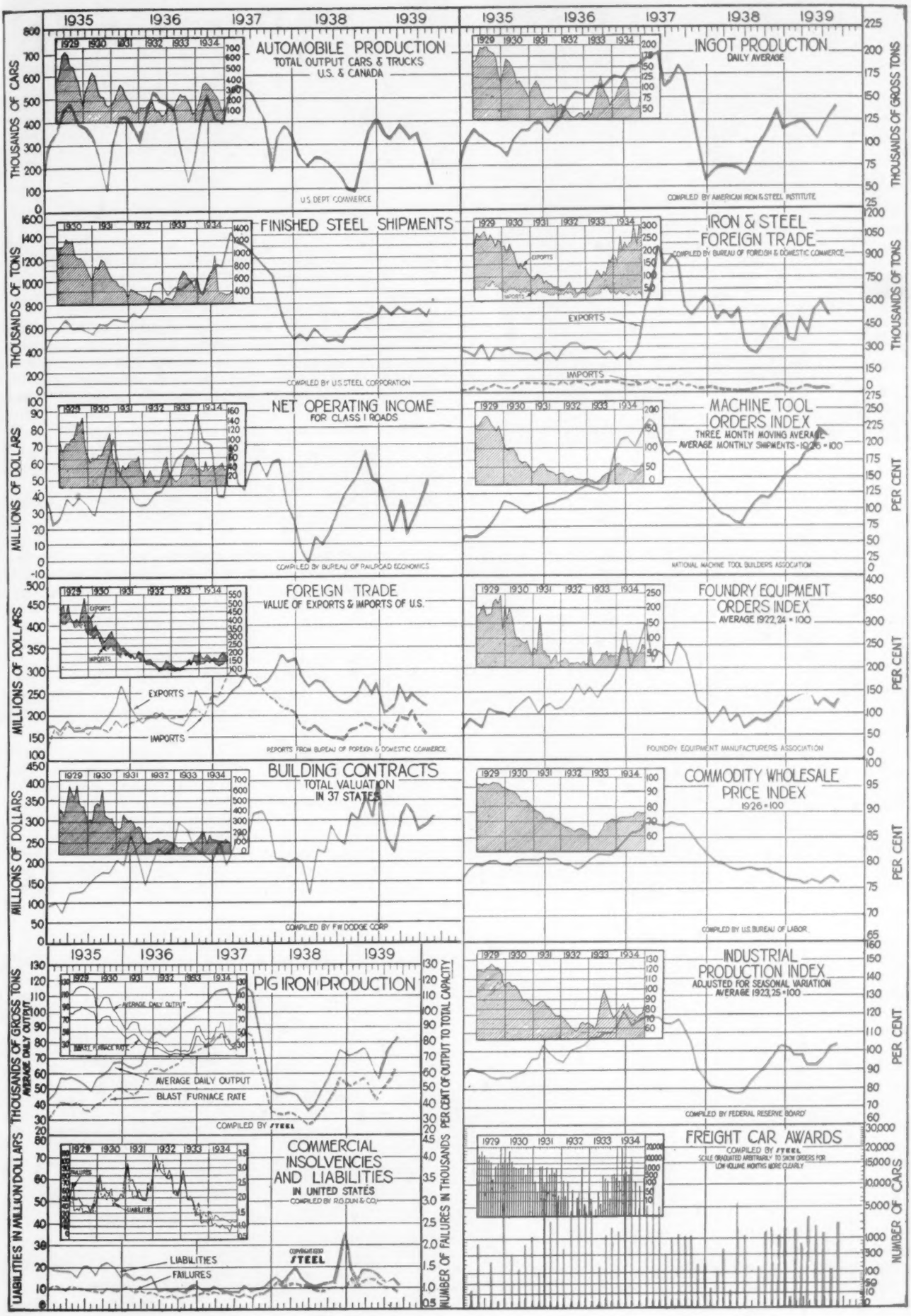
	Aug., 1939	July, 1939	Aug., 1938
25 Industrial stocks	$178.21	$178.03	$177.53
25 Rail stocks	$20.68	$21.45	$21.95
40 Bonds	$71.49	$71.82	$70.98
Bank clear'gs (000 omitted)	†$21,386,000	$23,022,000	$21,624,000
Commercial paper rate, New York (per cent)	½–⅝	½–⅝	¾
*Com'l loans (000 omitted)	$8,209,000	$8,166,000	$8,270,000
Federal Reserve ratio (per cent)	86.9	86.3	82.4
Capital flotations:			
New capital	$112,129,000	$317,525,000	$182,286,000
Refunding	$346,471,000	$268,207,000	$235,650,000
Federal gross debt (millions of dollars)	$40,891	$40,661	$37,596
Railroad earnings	†$53,000,000	$49,011,915	$45,376,622
Stock sales, New York stock exchange	17,372,281	18,065,610	20,722,930
Bond sales, par value	$111,416,850	$119,475,000	$120,531,425

*Leading member banks Federal Reserve System.

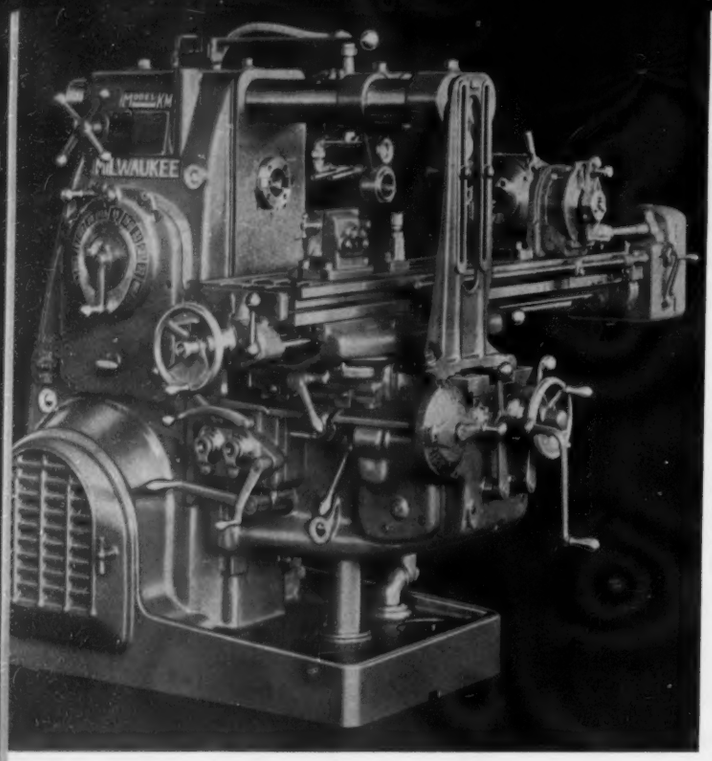
†July, June and July, respectively.

Commodity Prices

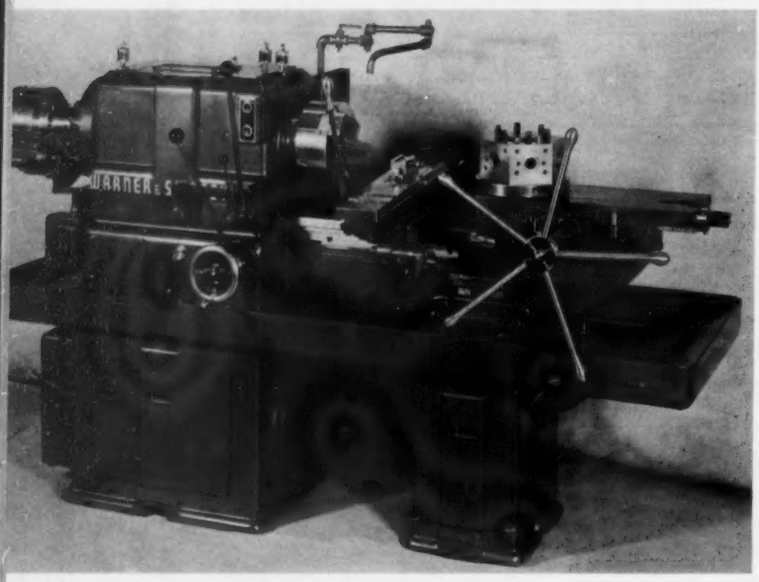
	Aug., 1939	July, 1939	Aug., 1938
STEEL'S composite average of 25 iron and steel prices	$35.95	$35.82	$36.50
U. S. Bureau of Labor index	75.1	76.5	78.4
Wheat, cash (bushel)	$0.84	$0.83	$0.79
Corn, cash (bushel)	$0.59	$0.56	$0.68


1935
1936
1937
1938
1939
AUTOMOBILE PRODUCTION
TOTAL OUTPUT CARS & TRUCKS U.S. & CANADA
THOUSANDS OF CARS
U.S. DEPT. COMMERCE
INGOT PRODUCTION
DAILY AVERAGE
THOUSANDS OF GROSS TONS
COMPILED BY AMERICAN IRON & STEEL INSTITUTE
FINISHED STEEL SHIPMENTS
THOUSANDS OF TONS
COMPILED BY U.S. STEEL CORPORATION
IRON & STEEL FOREIGN TRADE
COMPILED BY BUREAU OF FOREIGN & DOMESTIC COMMERCE
EXPORTS
IMPORTS
NET OPERATING INCOME
FOR CLASS I ROADS
MILLIONS OF DOLLARS
COMPILED BY BUREAU OF RAILROAD ECONOMICS
MACHINE TOOL ORDERS INDEX
THREE MONTH MOVING AVERAGE
AVERAGE MONTHLY SHIPMENTS - 1926 = 100
PER CENT
NATIONAL MACHINE TOOL BUILDERS ASSOCIATION
FOREIGN TRADE
VALUE OF EXPORTS & IMPORTS OF U.S.
REPORTS FROM BUREAU OF FOREIGN & DOMESTIC COMMERCE
FOUNDRY EQUIPMENT ORDERS INDEX
AVERAGE 1922-24 = 100
FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION
BUILDING CONTRACTS
TOTAL VALUATION IN 37 STATES
COMPILED BY F.W. DODGE CORP.
COMMODITY WHOLESALE PRICE INDEX
1926 = 100
COMPILED BY U.S. BUREAU OF LABOR
PIG IRON PRODUCTION
AVERAGE DAILY OUTPUT
BLAST FURNACE RATE
THOUSANDS OF GROSS TONS AVERAGE DAILY OUTPUT
PER CENT OF OUTPUT TO TOTAL CAPACITY
COMPILED BY STEEL
INDUSTRIAL PRODUCTION INDEX
ADJUSTED FOR SEASONAL VARIATION
AVERAGE 1923-25 = 100
COMPILED BY FEDERAL RESERVE BOARD
COMMERCIAL INSOLVENCIES AND LIABILITIES
IN UNITED STATES
COMPILED BY R.G. DUN & CO.
LIABILITIES IN MILLION DOLLARS
NUMBER OF FAILURES IN THOUSANDS
LIABILITIES
FAILURES
COPYRIGHT 1939 STEEL
FREIGHT CAR AWARDS
COMPILED BY STEEL
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS FOR LOW-VOLUME MONTHS MORE CLEARLY
NUMBER OF CARS

VERSATILE

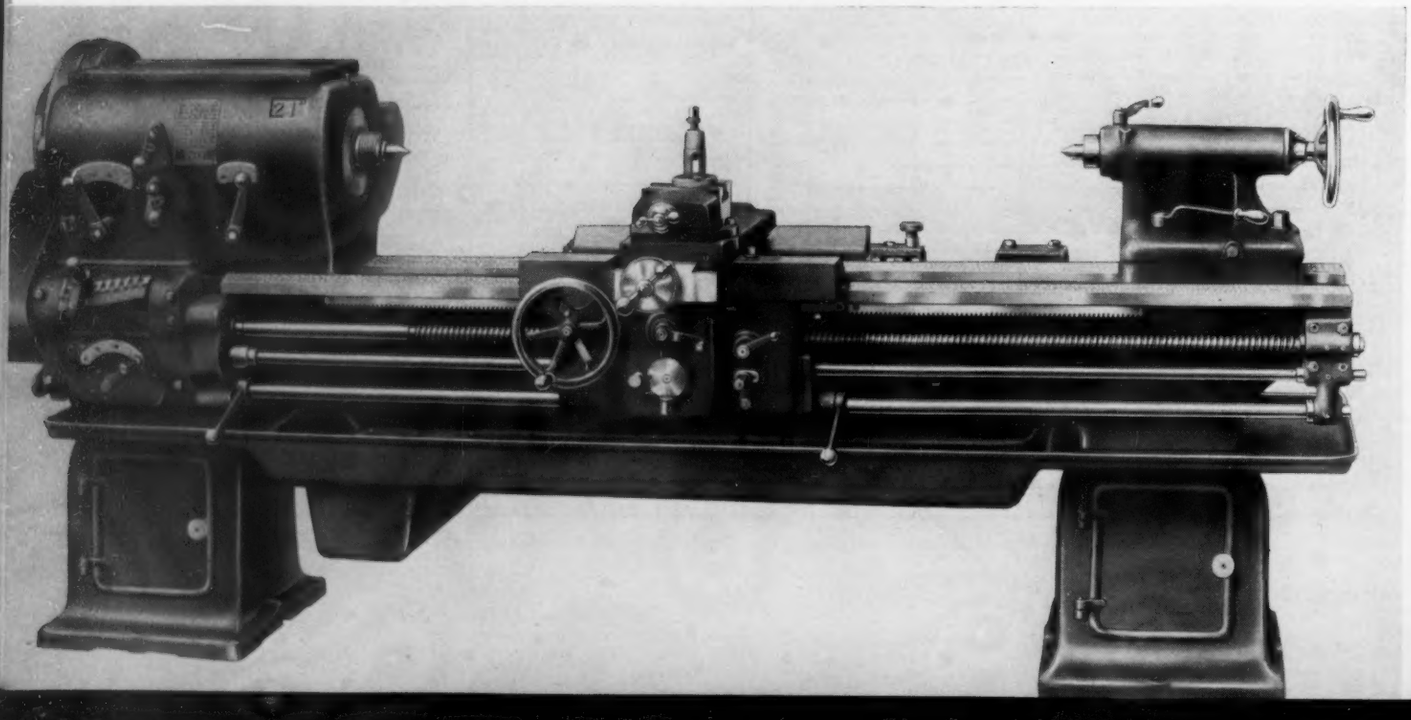


■ Kearney & Trecker medium speed model 3 KM Milwaukee milling machine, top, features duplicate front and rear controls arranged with safety positive interlocks, single lever continuous series feed selection, solid back column, cross-mounted motor center bearing spindle mounting and double overarms. There are 16 speeds in geometric progression without overlapping, ranging from 15 to 750 revolutions per minute, and 16 feed changes ranging from ½ to 30 inches per minute for table and saddle movements. Finger-tip controlled power rapid traverse is available whether spindle is stopped or running. Kearney & Trecker Corp., 6784 West National avenue, Milwaukee



■ Warner & Swasey brass machine, left, has a 16¾-inch swing, direct two-speed drive and electrically-operated mechanical brake. Two spindle speeds and reverse are automatically controlled by indexing of the hexagon turret. The operator needs only to start and stop the machine and set the controls. The machine automatically will go through any cycle of the two speeds and forward and reverse. A stationary air cylinder also may be used for faster reversal of the spindle. The turret slide and saddle are completely guarded to keep chips out of operating parts. Warner & Swasey Co., 5701 Carnegie Avenue, Cleveland

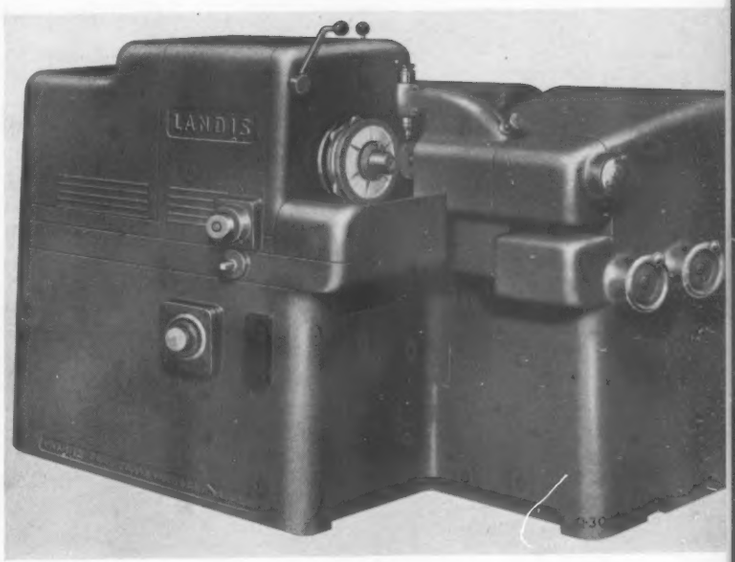
■ LeBlond 21-inch Super Regal lathe, below, has eight spindle speeds obtained through sliding gears. Final drive is through helical gears. Lathe has a lead screw and feed rod. For frequent and rapid starting and stopping, direct motor control or multiple disk clutch and brake are furnished. A single point attachment is provided which allows plates to be adjusted to as little as 0.003-inch. R. K. LeBlond Machine Tool Co., Madison and Edwards roads, Cincinnati



New Machines

■ Ex-Cell-O No. 33 external precision thread grinder, above, will grind threaded sections up to 6 inches in diameter, 8 inches long, on work up to 18 inches between centers. A taper attachment permits grinding up to 3 inches included taper per foot. Grinder uses 18-inch wheels running in oil coolant and grinds continuous and multiple right and left-hand threads with any pitch from 1 to 80 per inch. Most standard threads can be produced directly from solid, hardened blanks on a production basis. Ex-Cell-O Corp., 1200 Oakman boulevard, Detroit

■ Landis 18-inch radial cam grinder, right, has an 18-inch swing and will grind angular-type engine cams as well as the conventional type. Work speeds from 2 to 12 revolutions per minute are obtained by large speed selection dial. All electric controls and coolant reservoir are built-in. Hand-wheel feed only. Work is held on an arbor by a quickly removable C washer and provision has been made for timing so cams will be ground in proper relation to keyway. Landis Tool Co., Sixth and Ringgold streets, Waynesboro, Pa.



■ Lucas No. 548 and 560 horizontal boring machine, below, features multi-position, electric pendant directional control for spindle rotation and traverse of all sliding units including spindle. Hi-Lo dual control, at head or bed level, shifts speed and milling feed gears in boxes on bed. Rigid 5-inch main spindle has slow speed drive through large diameter gears and high speed drive through multiple V-belts. Its 60-inch continuous traverse is by lead screw, large dial on head indicating exact extension beyond face plate. An adjacent dial can be set to trip spindle feed at any point in the full 60-inch traverse. Table is provided with "jump feed" crosswise and provision for pre-selection of traverse facilitates milling around rectangular edges by instantly shifting from table cross to head vertical feed and vice versa. Lucas Machine Tool Co., 523 East Ninety-ninth street, Cleveland

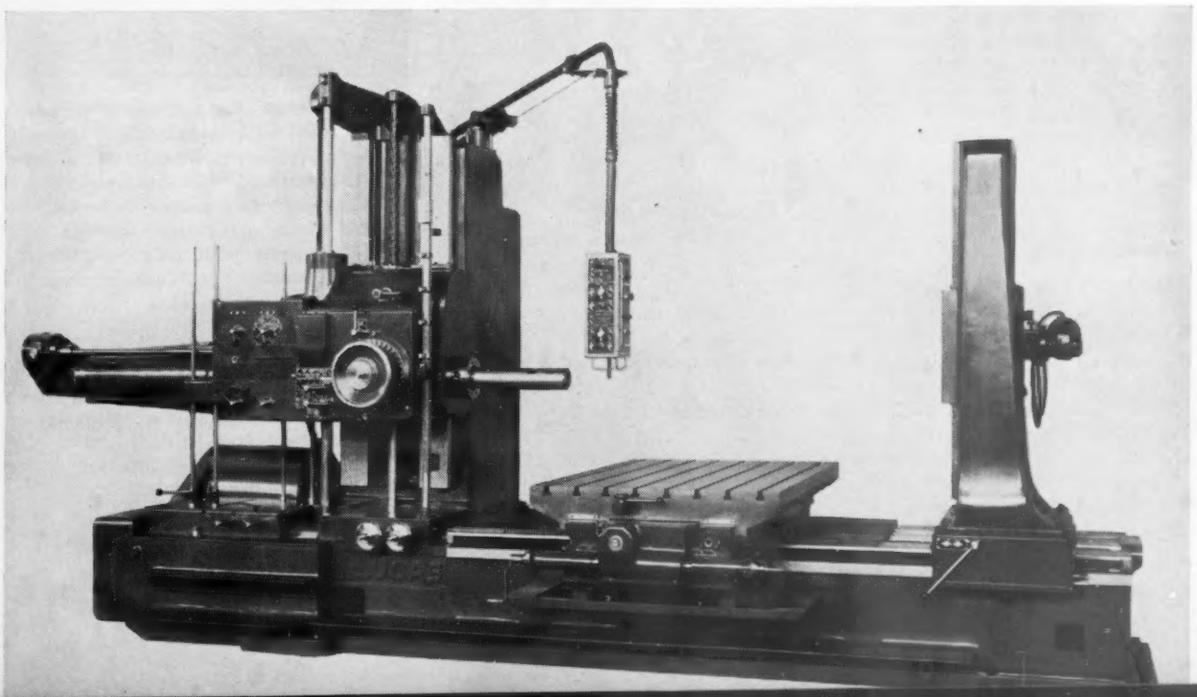


Fig. 1—Curled chips machined from Croloy Bonded plate show that even this severe deformation does not cause failure of the bond

New Cladding Holds Important

Using multiple layers of thin material permits resistance welding a protective alloy surface to thick plates for processing equipment where modern high-pressure high-temperature operation accentuates corrosion. Thin nickel sheet stops carbon migration

■ MANUFACTURING an extremely wide variety of processing equipment for oil and chemical industries, engineers of Babcock & Wilcox Co., Barberton, Ohio, early encountered the problem of corrosion of the metal used in processing vessels. At first, when comparatively low pressures and temperatures were employed, corrosion was not such a severe problem and was taken into consideration when designing equipment by using large thicknesses of metal. However, with the increased temperatures and pressures necessitated by modern processing work, it is essential that noncorrodible metals be employed in order that reasonable life be obtained from the equipment.

Thin Coating Reduces Cost

Most satisfactory materials appear to be chromium or chromium-nickel stainless steels. However, the cost of such alloys is so high that it prevents building relatively thick-walled vessels entirely of such material, and so it was necessary to develop some means of placing a comparatively thin shell of stainless on the inside surface.

One of the first methods tried in an attempt to fasten the cladding to the base metal was to drill or punch holes in the cladding; plug welds then joining the two materials. Also, much work was done using resistance spot welds to hold the cladding to the base metal. Some difficulties were encountered on plug and spot welded alloy linings where the welds were widely separated.

In an endeavor to overcome this, more welds were used and it was found that as a 100 per cent welded surface was approached, better and better results were obtained. This led to investigating methods of bonding the entire surface to the base metal.

Full Bond Obtained

In the new method this 100 per cent bond is obtained by using a pair of large copper wheels to carry a heavy welding current from one wheel down through the clad material into the base metal and back up through the clad material into the other wheel. However, with ⅛-inch thick cladding, so much current was carried directly from one wheel to the other by the shunting effect of the cladding material that it was difficult to get a weld to the base metal. Also, so much heat was developed at the surface where the wheels contacted the cladding that excessive melting occurred.

Successively thinner sheets were tried, 1/16-inch sheet giving slightly better results and 1/32-inch sheets being found quite satisfactory. However, this thickness of alloy material was entirely too thin to meet the service conditions encountered by these processing vessels.

To get a thicker alloy layer, two 1/32-inch sheets were tried and the

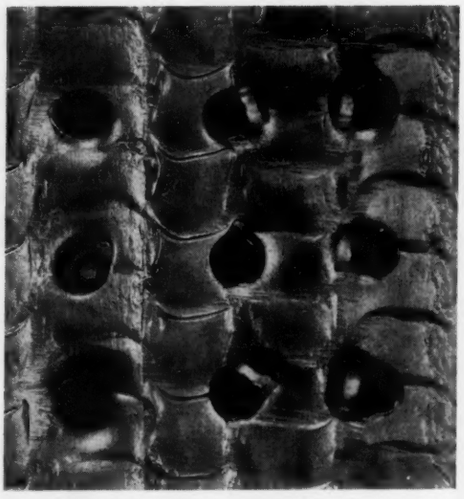


Fig. 2—Punch test. A square nosed punch inserted in holes drilled through base metal and flat-bottom at the alloy layer and then punched failed to tear the alloy from the base but made clean punctures through the cladding even with only ½-inch between holes. Note overlapping of welds, also

Method Possibilities

welding found to be notably improved.

In all these investigations, as in the perfected process, the copper wheels carrying the current are of a special alloy to permit developing extremely high pressures on the surface of the material as these are essential to perfect welding. Similarly, welding currents are quite high, running up to nearly 30,000 amperes. As the two wheels traverse the surface, they weld a strip about ⅝-inch wide in a series of overlapping intermittent welds. Wheels then pass back along the adjacent area so they cover and eventually weld every portion of the surface, which appears as shown in Fig. 2.

With a satisfactory welding procedure developed, it was next essential to consider the quality of the surface produced.

Carbon Migration Prevented

Since composite plates made of the stainless cladding and low-carbon base steel are heated during welding and heat treating, it is most essential to prevent carbon from migrating to the stainless cladding from the base metal, either during the cladding operation or during subsequent heat treating and welding.

Stainless steels at high temperatures have great attraction for carbon, which is readily dissolved from adjacent base metal at temperatures encountered in welding and heat treating. Unless such migration of carbon is prevented, the chromium stainless steel may exhibit the phenomenon known as carbide precipitation when held within a certain critical temperature range.

This necessitates screening the stainless steel cladding from the base metal. A pure nickel sheet was found to be most suitable. While only 0.01-inch thick, this is all that is necessary to prevent the carbon from being absorbed by the stainless clad metal.

The layer construction with the three separate sheets of material and the thick metal base are readily seen in Fig. 4, which also shows the overlapping pattern of welds.

Thus in the final cladding operation as developed by Babcock & Wilcox, the two top sheets consist of 11 to 14 per cent chromium with carbon limited to 0.08 per cent, the third 0.01-inch nickel sheet preventing carbon migration. This is known as stainless alloy type 410. The cladding is now being applied successfully in a 7/64-inch thickness on steel plates of various thickness, the most common ranging up to 3 inches although much heavier plates can be clad satisfactorily. It has been used successfully on plate as thin as ½-inch.

Multiple Layer Construction

Successful operation of the new welding method is due to a great extent to the multiple layer construction. By having three layers of material welded simultaneously, there is sufficient resistance to the flow of welding current in the cladding metals to permit development of the necessary heat and to reduce the required pressure on the sheets to a practical value. The increased flexibility of thinner sheets permits greater localization of the pressure and is an important factor. By passing the current through several areas of contact between the alloy

(*Please turn to Page* 63)

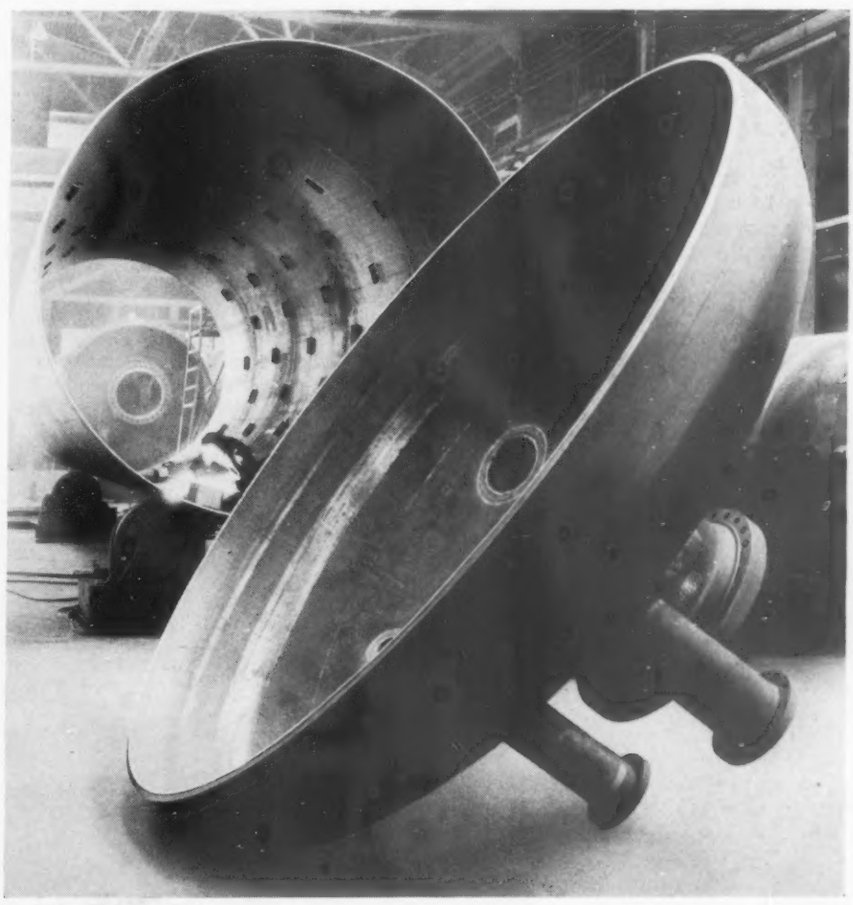


Fig. 3—Refinery coke chamber with hot-spun head and shell of Croloy Bonded plate. Shell diameter 12 feet, length 50 feet. Internal clips can be welded directly to clad lining. Head was spun without wrinkles or cracks developing, a most severe test of the bond between the 5/64-inch cladding and the 1⅛-inch plate

Open-Flame Annealing

Entirely new principle brings added flexibility, speed and economy to wire annealing. Important equipment developments include first mechanism to afford automatically a continuous indication of anneal. Also controls flame or wire speed for full automatic operation

By HARRY W. SMITH JR.
American Gas Association
New York

■ ONLY POLITICIANS, and perhaps salesmen, can proclaim "new eras," "revolutionary developments" and "astounding strides forward" without a guilty conscience. But during the summer of 1939 we have followed from secretive experiment to industrial full-bloom the development of a new process for the continuous annealing of nonferrous wire at lightning speeds, which, to stay on the safe side, certainly merits a second look by anyone concerned with nonferrous metalworking or treatment.

New Annealing Principle

We refer to the new-principle *open-flame* strand-anneal apparatus devised by Syncro Machine Co., Rahway, N. J., in co-operation with Surface Combustion Corp., Toledo, O.,—an ingenious gas-fueled production line which automatically handles wire at paces up to 1500 feet per minute without either furnace or atmosphere tube and delivers a uniformly bright-annealed product with a minimum of fuel, labor and equipment.

Being totally unconventional in design, proof of the equipment's practicability under actual plant conditions was an important step in its rapid 2-year development. Accordingly, it received its "final examination" in Rahway, N. J., during May and June of this year on a test run of 10 to 20,000 pounds of copper; and performed so handsomely that 28 units have already been sold to "pilot" operation in five well-known wire mills. Nineteen of these are short low-speed lines with 2-foot annealing burners feeding bright-annealed wire into continuous enameling equipment at speeds of from 10 to 30 feet per minute. The other nine are of latest design with longer rows of open gas jets and are used to continuously bright-anneal, pickle and tin No. 6 to 36 wire at speeds of from 190 to 1500 feet per minute. In six of these nine cases, 27-foot burners are used to allow for maximum wire speeds; in one case a 9-foot burner is employed; and in the remaining two a 4½-foot burner is ample in view of the small gage wire being run.

Before looking at the new open-flame annealing process in detail, consider what it can mean to the wire industry as its adaptations and acceptance grow. At the moment it seems that its principal usage will be for straight bright annealing, either on finished wire or between breakdowns. At various speeds, it will fit(as it already has) into anneal-enamel and anneal-pickle-tin combination setups—and bring the extra economy of eliminating separate coating lines and the delay, labor and floor space they involve. It has even been demonstrated that the unit will work on stranded wire.

No Furnace Used

As a straight bright-annealing unit, its chief economies over existing methods of copper and brass annealing result from the fact that there is no furnace to heat-up, cool down or maintain at heat. As a result less fuel is used. Even neglecting this major economy of eliminating heat-up and furnace-maintenance fuel, the consumption of the new type unit *during full operation* averages only ½ cubic foot of manufactured gas per pound of wire annealed.

Also as over and against batch

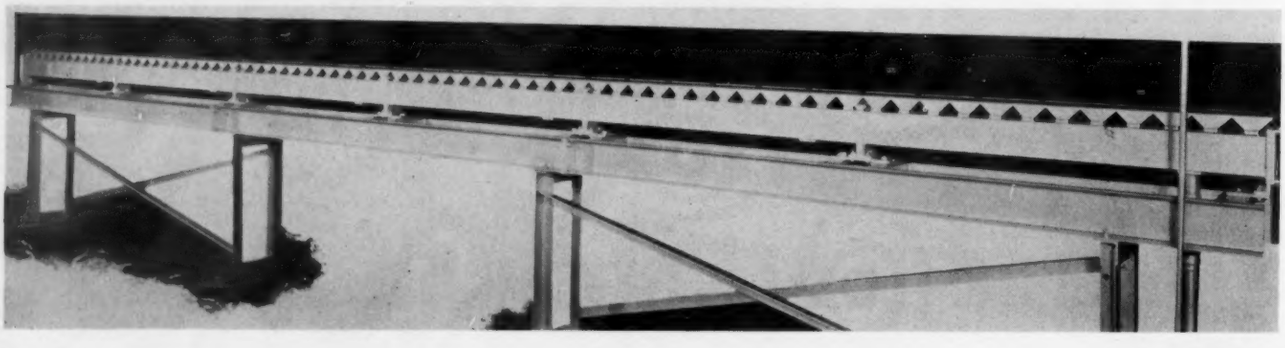
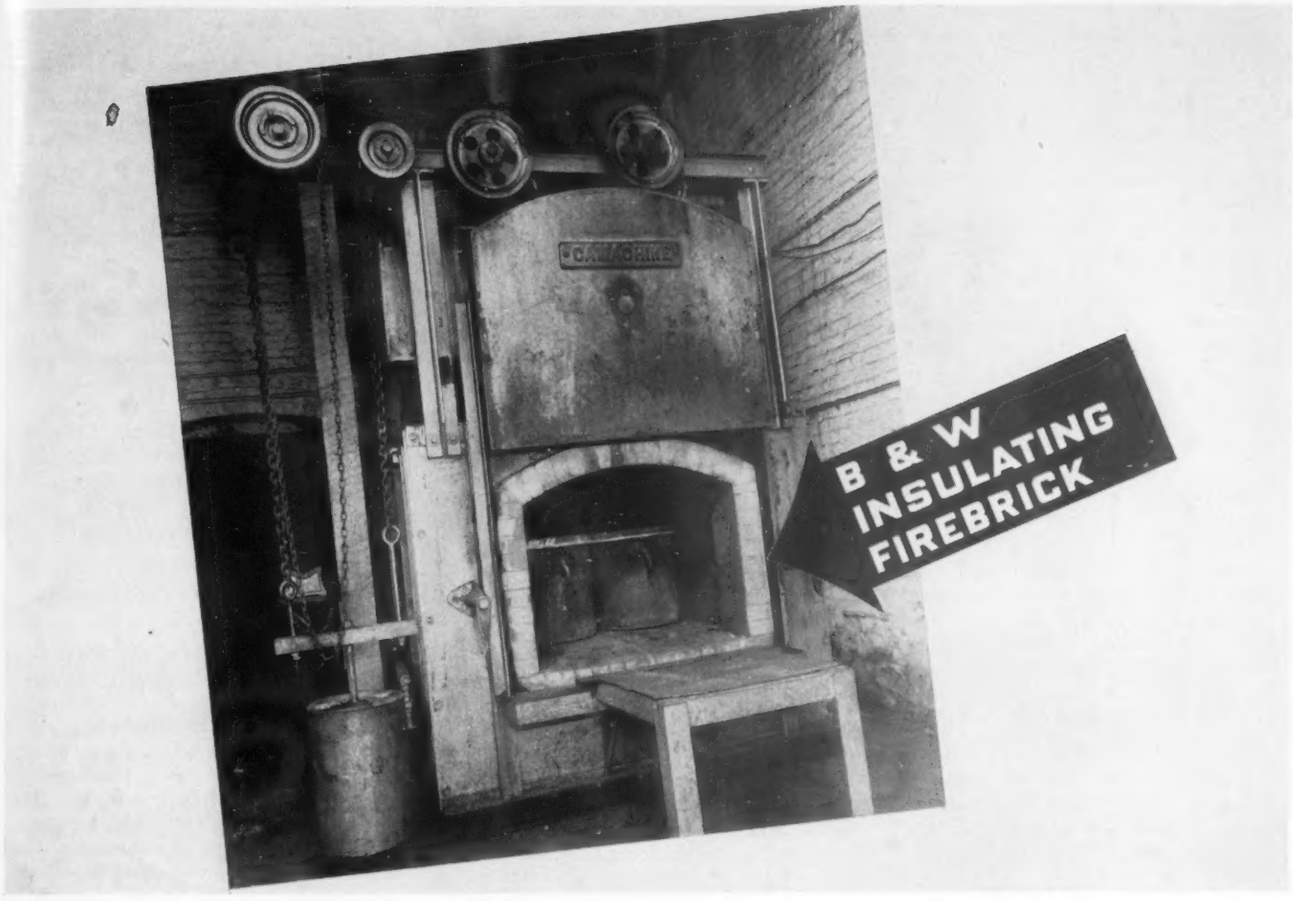


Fig. 1—These gas flames continuously anneal nonferrous wire at speeds up to 1500 feet per minute without furnace or atmosphere tube. Wire passes longitudinally through core of 27-foot ribbon of flame seen as a broken white line just above the burner assembly. Photos courtesy American Gas association, 420 Lexington avenue, New York



"Saving about 40% in Fuel"

reports Supt. of Cameron Machine Co.

Inside this large carburizing furnace are seen pots containing parts used on slitting and re-winding machines.* Walls and arch are lined with 4½ in. of B&W Insulating Firebrick, which are also used by this Brooklyn manufacturer in two other furnaces and a lead pot.

Heating-up and holding time is now approximately 20 hours, compared with about 25 hours for firebrick. The change to B&W Insulating Firebrick has effected a saving in fuel (high-pressure gas, underfired) of about 40 per cent, according to the superintendent.

Carburizing temperatures run between 1600 and 1700 F., and are uniformly maintained. The furnace is also used for hardening. Hearth is 36 in. by 95 in.; height is 28 in.

Write for data about the thermal, refractory and physical characteristics of B&W Insulating Firebrick, and the possibility of increased efficiency in your industrial furnaces, regardless of type.

* These machines are used principally in the paper, rubber and textile industries.

R-92

THE BABCOCK & WILCOX COMPANY
85 LIBERTY STREET . . . NEW YORK, N. Y.

BABCOCK & WILCOX

annealing, it is not necessary to heat reels (which is none too good for them) and only a few feet rather than many tons of wire are spoiled if anything does go wrong. Handling of material is much reduced and annealing equipment operation is easier because of the continuous feature of the process. Long-cycle heating in bulk (often including soaking periods to attain uniform anneals from the core to the surface of large batches) is totally eliminated. Because open-flame annealing lines can be started or stopped in an instant without loss of efficiency, they also minimize the finished stock necessary for annealers to carry to cover orders for immediate delivery.

Most of the units built so far can handle with from No. 6 (0.162-inch) to No. 16 (0.051-inch) B & S gage, although smaller units are being made to handle wire down to around No. 36 (0.005-inch). To date, units with the 9-foot open-flame-anneal burner are capable of speeds up to 225 feet per minute on No. 14 strand. The 27-foot burner models can triple that speed. On the smallest sizes of wire it has been shown that, with 4½-foot burners, velocities up to 1500 feet per minute can be reached before special spooling problems are encountered.

Gas Flames Accurately Controlled

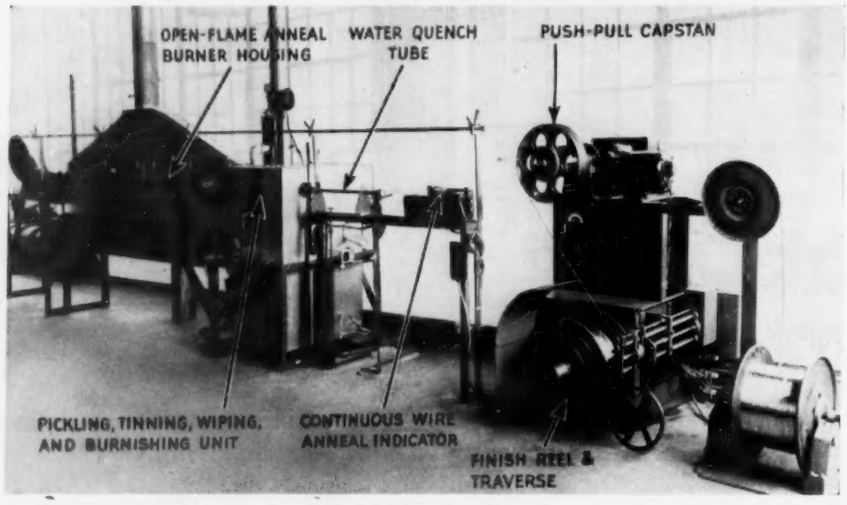
Essentially, the apparatus consists of a long row (2 to 27 feet) of gas flames, controlled with extreme accuracy. Positioning dies are spaced along the row of burners so wire passes through just that portion of each flame in which combustion has advanced exactly to the point where both temperatures and burning-gas compositions are "just right" for the anneal. Each flame is a stubby ribbon of fire, 4½ inches long and as thick as the slot (0.030 to 0.060-inch) through which mixed gas and air pass into the combustion zone. The flames are placed end-to-end as shown in Fig. 1 to form the compound burner length. In this view, the horizontal white bars spaced end-to-end above the compound burner body are actual photo-images of the flames (obtained by double exposure after the burner system had been photographed and the room darkened). Adjustment of the anneal is provided either by the height and character of the flames or by the speed of the wire as it faces along its flaming route. The entire burner assembly is enclosed in a sheet metal housing equipped with flue and side doors, Fig. 2, to prevent factory drafts from disturbing the exactly regulated flame position.

Burners are fed with premixed gas and air delivered under positive pressure from one of the many types of automatic gas-air proportioning devices now on the market. Adjustment of the ratio of air to gas is almost exactly that theoretically required for complete combustion. A compound annealing burner 9 feet long will consume about 80 cubic feet of manufactured gas per hour.

Wire Always Under Tension

It is worth while to trace in Fig. 2 the complete cycle of wire flow from supply reel to finish reel. Almost every element of the apparatus involves newly patented, ingenious features developed by engineers of Syncro Machine Co., builders of wire-making equipment for the nonferrous metal industry for nine years. From the supply reel, wire passes over an idler pulley to the push-pull capstan, which it loops once for positive input speed control. This same capstan carries the delivery sheave. This sheave is slightly larger in diameter than the feed sheave so wire in the entire anneal-pickle-tin line at any instant is always under a positive tension equivalent to one-half of one per cent elongation. From the delivery sheave of the push-pull capstan, the wire passes on to a traverse—and idler-pulley combination which feeds it to the finish reel. At this point, it is worth noting that the traverse-idler-pulley combination shown in Fig. 2 is of an older type, the modern type being designed so pulley rotates around the traverse bars to minimize any eccentric load upon traverse mechanism.

From feed sheave on the push-pull capstan, wire travels through an elongated feed tube to idler pulley at other end of the line, whence it is directed through a wire brush cleaner, Fig. 3, consisting of cylindrical brushes, above and below the wire, rotating in directions counter to the wire flow and oscillating



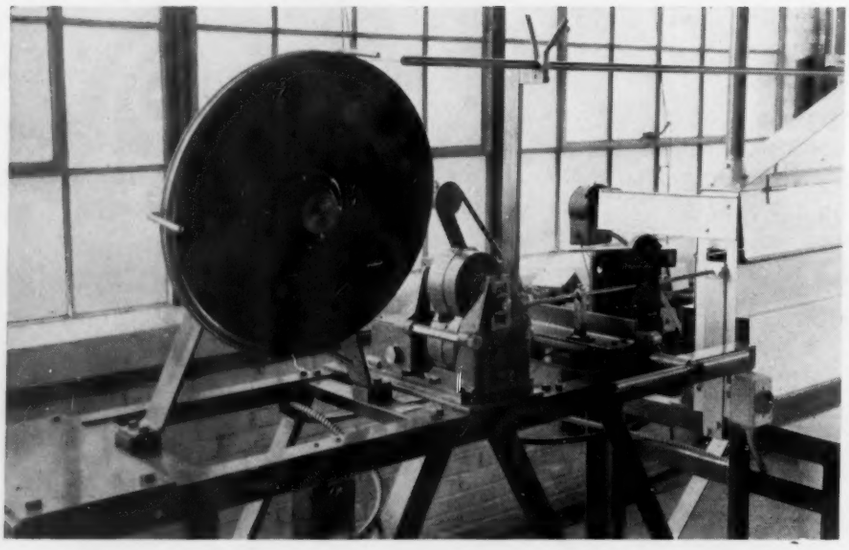


Fig. 2. (Upper)—Complete open-flame anneal-pickle-tin line designed to handle No. 14 wire at 225 feet per minute. Various elements in line are marked. Fig. 3. (Lower)—Before wire encounters flame jets, it is cleaned by wire brushes. Then it passes between feeding rolls, disengaged after threading is complete

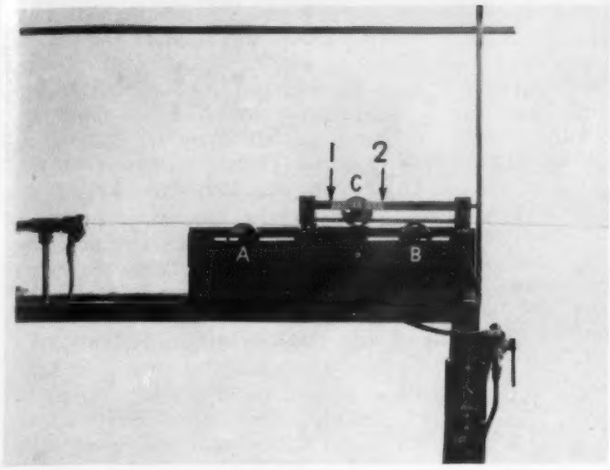


Fig. 4—This instrument continuously indicates the degree of anneal as wire passes through it at production speeds and furnishes means for automatic control of annealing

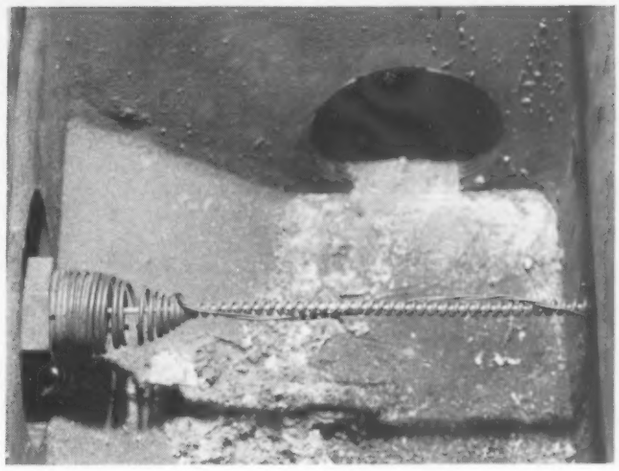


Fig. 5—A simple device, but one which even at high speeds effectively wipes (in heat zone) or burnishes (outside heat zone) the spring shown

back and forth along their axis of rotation. From this cleaner, wire passes between the two steel rolls of a motor-driven feeder—an element which is disengaged from the line except at the beginning of a run when it performs its duty of driving the wire through the anneal-pickle-tin line into position to be hand-threaded over the capstan, through the traverse and onto the finish reel.

Wire Positioned in Flame

The cleaned wire passes through the annealing flames as previously described, its exact position within the cross section of the air-gas flame being insured by cast iron die holes every 4½ inches. Obviously, wire traveling at 225 feet per minute through the core of a 9-foot ribbon of flame would be in the annealing heat zone 2.4 seconds.

From the annealing burners wire may go directly through the water-quench tube and emerge beautifully bright-annealed, or, it may flow through special continuous pickling, tinning, wiping and burnishing devices before being quenched, dried and spooled as coated material as in Fig. 2. In either event, carefully machined "restrictions" at either end of the water-cooled quenching tube are fitted with suction offtakes to prevent any water from leaking out the ends of the tube. From this point on, the wire dries rapidly by its own heat, or by compressed air jets if required.

Just beyond the quenching tube is an amazing device developed by Syncro to provide a constant visual indication of the anneal—a unit which may be used as an automatic control of either wire speed or flame height to hold the anneal constantly at the desired point. This device, shown in Fig. 4, is the first element made available for continuously indicating degrees of anneal as wire passes through it at production rates, insofar as can be determined.

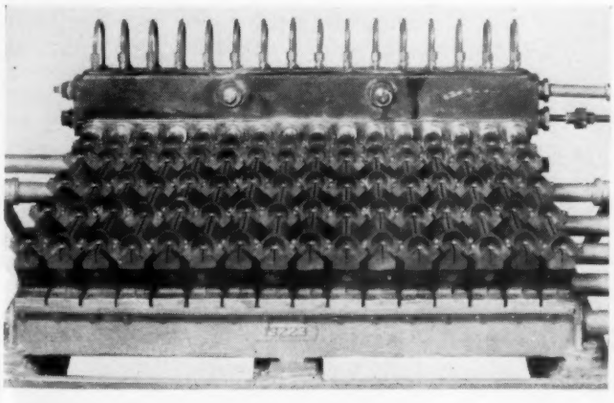
It consists of two fixed wheels, A and B, over which the wire passes, and between which it is depressed by the floating wheel, C. The wheel, C, rides in a ball-bearing (as frictionless as possible) which in turn rides on longitudinal rods located behind the scale bar as in Fig. 4. As a result, it has a tendency to move forward from its normal mid-position between A and B with the forward motion of the wire. The degree to which it floats forward is an inverse index of the hardness, or "springiness," of the wire, and, hence, a measure of the resultant anneal.

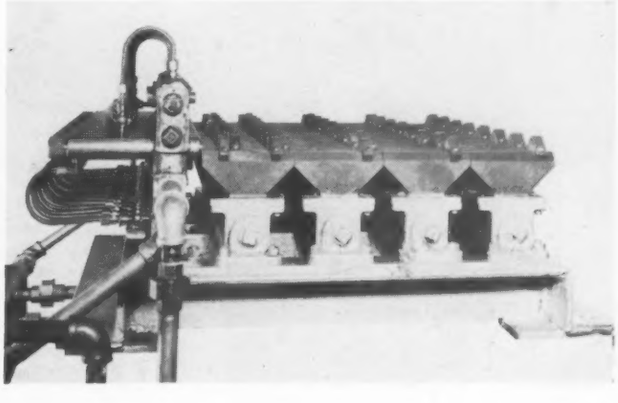
Automatic Control Possible

In Fig. 4, position 1 would be assumed by the floating wheel if the wire were one hundred per cent hard or "springy," whereas position 2 would be assumed if the wire were extremely soft. Points between these two locations can be calibrated against actual elongation tests to furnish the anneal indication at a given wire speed and tension. It is possible to arrange the floating wheel to actuate the movable contact of a Wheatstone bridge or to interrupt beams directed at photo-electric cells, thus automatically controlling either wire speed or flame characteristics according to the anneal desired.

The pickling and tinning apparatus

Fig. 6. (Left)—Head-on view of bright-anneal burners for a 16-line anneal-enamel setup. Note wire positioning dies centered just above burners. Fig. 7. (Right)—Side view of same unit with gas and air manifolds at left. Note individual valves for adjustment of each line of burners





is equally ingenious and worthy of attention. For the continuous pickle, wire passes through a cell of Pyrex glass into which are injected dry chlorine gas and other vapors at a temperature of 500 degrees Fahr. which even at such breakneck speeds effect a most efficient cleaning and fluxing.

Thence the wire passes through a special cast iron channel or bore into the side of which molten tin at 500 degrees Fahr. is pumped under low pressure to flow out either end and be retrieved—an appropriate portion of it in the meantime having adhered to the wire streaking by.

Spring Wipes Wire

Beyond the tinning bore, but still in the heat zone, is a wiping device of ingenious though simple design. It consists of no more than a long spring, Fig. 5, held between end blocks through which the wire passes. Although no single one of the 40 small convolutions of this spring wipes the complete circumference of the wire, there are so many coils that excellent wiping is obtained all around the wire before the complete spring length has been traversed. The burnishing device, just outside of the tinning furnace and in the open air, is an identical spring.

The tinning furnace itself also is gas fired from the rear by the immersion tube principle for highest thermal efficiency. The unit is sufficiently wide to handle six wire lines at once from a common tin pot of one-half to one ton capacity. In the latest models, the tin is pumped through a gear pump at less than one pound per square inch pressure.

Exhaustive tests show that the new open-flame units produce a most acceptable uniformity of anneal. Further tests have clearly demonstrated the cleanliness of the surface of the bright annealed wire delivered. Practical proof may be found in the successful applications of Syncro open-flame anneal equipment to continuous wire-enameling operations wherein the new synthetic enamels are applied to the wire. See Figs. 6 and 7. Wire, to be enameled with these new synthetic products, must be almost chemically clean to insure good adhesion of the coating rather than a mere deposition of an organic "sleeve."

Any consideration of the new Syncro continuous open-flame annealer as a whole, reveals two significant characteristics. First, it adapts the mechanical principles of "automatic machinery" to a job heretofore considered only in terms of "furnaces." Second, it represents a complete production line composed of a sequence of separate ingenious elements or building blocks, each flexible in its own function but capable of being used in various combinations with other elements to adapt the new principle of open-flame heat treatment to a wide range of ultimate wire products and individual plant requirements. These characteristics, coupled with the continuity, speed, control and economy the apparatus brings to wire annealing, should assure its future as a profitable new tool for the nonferrous metal industry.

♦

Mirrors of Motordom

(*Concluded from Page* 32)

exclusively as optional equipment on its three 1940 lines. The division only recently has been equipped at a cost of $3,000,000 to produce the transmission which will be priced at a reported $60-$70. Obviously this means some degree of subsidization of the development by the corporation until its acceptance can be proved.

The device, known as the "hydra-matic" drive, is a combination of automatic transmission, fluid flywheel and overdrive, the transmission being an outgrowth of the semiautomatic transmission offered by Olds and Buick two years ago.

By combining the fluid or liquid flywheel with the gearbox, it has been possible to eliminate the clutch pedal altogether. Control of the car is centered in the accelerator pedal and a lever on the steering column which may be moved in any one of four positions—neutral, high, low and reverse.

To start the car, only four operations are required: Ignition key is turned, starter is actuated, level is moved to "high" position and the accelerator depressed. The car moves forward smoothly, changing gears automatically through first, second and third ratios until at 23 miles an hour it enters fourth speed, a direct drive with rear axle ratio of 3.6 to 1. Virtually all driving is done with the lever in "high" position, "low" being used only in deep sand or mud or in climbing or descending an extremely steep hill.

General Motors Flywheel

General Motors' version of the liquid flywheel is similar in principle to but quite different in construction from the Chrysler fluid drive. The driving and driven rotors have 48 vanes each on their inside surfaces and in the vanes is mounted a solid annular ring. Both rotors are enclosed in a housing into which oil is pumped from the transmission under 30 pounds pressure to insure adequate supply at all speeds. One rotor is driven by the centrifugal force of the oil thrown from the vanes of the driving rotor, the essential feature of all hydraulic torque converters. However, the rotors do not always travel at engine speed, since there is some gearing ahead of the fluid coupling and some behind it.

■ STUDEBAKER models for 1940 include three series—the Champion, the Commander six and the President eight. Exterior lines have been modified only slightly from the 1939 motif. Windshields and windows are wider and higher. Hoods are now locked from inside the car through a lever on the dash. All models feature sealed-beam headlamps, door handles streamlined into chromium plated belt-line moldings, concealed door hinges, vertical transmissions, optional free wheeling and overdrive. Rear springs are now rubber shackled on the two larger models.

■ Orders for steel boilers in August, as reported to the bureau of the census, totaled 1175, compared with 1033 in July and 1063 in August, 1938. Eight months' total this year is 7939, for the same period, 1938, they totaled 5834 and in the 1937 period 7900.

Intricate Die

■ This die built by Westinghouse Electric & Mfg. Co., Derry, Pa., for forming a dry-process electrical porcelain piece is made from one solid block of tool steel and has some 75 closely-toleranced dimensions to allow accurate fitting of 30 metal parts on the porcelain piece. Finished die weighs 300 pounds and has a surface polished to a glass-like finish

Steel Engineers Cite Economies From Improved Plant Practices

■ THIS YEAR is characterized by a complete absence of new construction of broad strip mills as well as lack of important engineering developments in this direction, with exception of American Rolling Mill Co.'s changeover at Middletown, O., coiling facilities at Inland's mill and introduction of a multi-roll mill. This was the observation of Stephen Badlam, consulting engineer, Pittsburgh, at the thirty-fifth annual convention of the Association of Iron and Steel Engineers in Pittsburgh, Sept. 26-29.

A report of early technical sessions of the convention are presented herewith; a resume of general features of the four-day meeting is given on page 21 this issue. Other technical sessions will be reported in the Oct. 9 issue of STEEL.

Mr. Badlam, addressing a session of the mechanical engineering division, pointed out that the reconstructed mill of American Rolling Mill Co. will produce larger coils than the original installation and up to weight of the ingot. In reviewing hot strip rolling practice, Mr. Badlam stated that much heavier slabs are used at present and that they are being rolled into larger coils than formerly. Improvements cited included increased operating speeds up to 2150 feet per minute, use of heavier slabs, increased heating capacity from 70 to 150 tons an hour and a reduction in the time lost in production.

Improve Coil Welding

In cold rolling practice, Mr. Badlam said, principles employed are unchanged, though details of practice have been modified. Coil ends now are being welded in such a manner that the welded section passes through the gap of the rolls in a satisfactory manner. Tandem mills now roll 800 tons of sheet stock in 8 hours and 500 tons of black plate for tinning in the same period. The trend in cold mill practice, he stated, is toward increased power and roll speed. All tin plate at the Indiana Harbor plant of Youngstown Sheet & Tube Co. now is being produced on continuous mills.

The speaker mentioned a mill being operated in this country consisting of one stand of 20 rolls for producing stainless steel up to 30 inches wide. It is said to effect a reduction in 1.00 per cent carbon grade ranging from 80 to 90 per cent in three passes without an anneal.

A. R. Schulze, chief engineer, Carnegie-Illinois Steel Corp., Youngstown, O., in speaking on economics of advanced engineering planning, pointed out that large expenditures frequently are made on production units which in a few years are abandoned due to a change on the process or on account of no demand for the product. The speaker cited welding and cutting as an outstanding influence in expansion of fabrication.

He suggested that companies estimate budgets at least 10 years in advance and that they recognize such phases as economy, function, tolerance and trade demand, new products and shifting markets. Engineering done on an immediate time basis seldom is best in the end, he emphasized.

Discussing modernization of existing open-hearth furnaces and auxiliary equipment, G. L. Danforth Jr., president, Open-Hearth Combustion Co., Chicago, explained that modernized designs of checkerwork and door frames require little or no cost when a furnace is relined. Such improvements, he stated, often are used to increase furnace operation 5 to 15 per cent.

Installation of sloping backwalls, and modern flues, valves, charging boxes, also will afford desirable returns. In surveying existing open-hearth furnaces and their auxiliaries he pointed out that larger furnaces are more efficient than smaller units. Nothing is to be gained by rapid charging of open hearths in one operation, he asserted, inasmuch as the bottom portion of the charge would not melt down at a desirable rate.

The speaker recommended additional trackage to reduce the movement of stock, storage tracks, the preparation of scrap so that a reasonable amount can be charged into a box, proper shearing of scrap, loading of scrap into boxes at the skull cracker, an adequate supply of charging boxes, and tapered doorways through which the scrap is charged. At present not more than half the charging machine capacity is taxed.

Open-Hearth Shop Costs

Ingot buggies carrying a single row of molds is better than those carrying a double row, Mr. Danforth pointed out. Cost of building a modern open-hearth shop will average about $10 per gross ton. With interest and amortization 10 per cent annually, the fixed charge will be about $1 per ton when the plant is operating at full capacity or $1.50 a ton with intermittent operation.

Demands of steel users for lightweight parts account for the intensive reconditioning of semifinished steel. Moreover engineering design and methods have advanced to the point where some form of service control is mandatory. This was emphasized at an operating practice session by A. P. Spooner, metallurgical engineer, Bethlehem Steel Co., Bethlehem, Pa.

Lighter construction is obtained by using harder steels and he warned that surface defects lead to

■ **Participating in the mechanical engineering session during last week's convention of the Association of Iron and Steel Engineers in Pittsburgh were: (left to right) A. R. Schulze, chief engineer, Youngstown district, Carnegie-Illinois Steel Corp., Youngstown, O.; G. L. Danforth Jr., president, Open Hearth Combustion Co., Chicago; C. J. Duby, chief engineer, Youngstown and Warren districts, Republic Steel Corp., Youngstown, O.; and Stephen Badlam, consulting engineer, Pittsburgh. Mr. Duby presided, the others presented papers**

failure more often in harder than in softer steels. Defects in soft and mild steels tend to weld during the rolling but this is not so with high-carbon steels. Formerly deep cuts were taken as a general rule but in present-day practice skin cuts predominate.

Cost of pneumatic chipping varies as much as 1000 per cent, he contended. Where steel is pickled prior to chipping, considerable more chipping is done and frequently cost of surfacing is increased 50 to 200 per cent.

Mr. Spooner mentioned importance of welfare of the chipper. He must have an opportunity to relax or his work decreases. At one plant the chipper is given physical relief and eye rest 15 minutes of every 2 hours. At another plant he is given only a limited number of round chisels so that he will be compelled to walk to the toolroom for an exchange and thereby obtain rest. At still another plant material to be chipped is placed at different levels to afford the chipper a change of posture.

Chipping Billets Mechanically

The wide range of flexibility and the ease of operation of the Billeteer, a unit for chipping steel mechanically, were explained by G. W. Lentz, chief engineer, Bonnot Co., Canton, O. The speaker's remarks were supplemented by motion picture. Costs of mechanical and hand chipping were compared.

One of the newer methods of cleaning semifinished steel is scarfing and this was explained by G. D. Winlack, Air Reduction Sales Co., New York. He stated that scarfing has revolutionized steel cleaning practice. This method of deseaming not only removes the defects but exposes minute defects otherwise escaping notice.

Typical comparison of annual deseaming and chipping costs per gross ton of steel were presented as follows:

	Chipping		Deseaming	
Grade of steel	Man-hours	Cost	Man-hours	Cost
Carbon	0.38	$1.58	0.11	$0.43
Alloy	3.00	$3.71	0.54	$2.83
Carbon and alloy	2.22	$2.74	0.19	$0.71

Discussing the carriage-type servicing machine for blooms 6 to 14 inches, the speaker said rate of travel ranges from 15 to 90 feet a minute. An operator rides the machine; upon working one line he swings the machine to the opposite side and services another row of blooms on the return trip. When removing a thickness of 3/32-inch, the unit travels 75 feet per minute.

Mr. Winlack also described a stationary machine which is installed in the rolling mill table. Blooms up to 9 inches square and in transit are resurfaced in one pass.

With certain grades of steel, such as self-hardening tool steel, chrome-nickel, high-chrome and other alloy steels, grinding is really the only satisfactory method of cleaning billets and removing defects. This was the contention of A. Rousseau, Norton Co., Worcester, Mass. Wheels either of resinoid or rubber bonded type are made of coarse grit with cutting grains anchored deeply. Wheel operating speed is 6000 surface feet per minute for vitrified wheels and 9500 surface feet per minute for rubber wheels, he stated.

Two important factors affect economy of grinding, namely, wheel speed and grinding pressure. Rate of cut and rate of wheel wear, the speaker stated, are proportional to surface speed of the wheel. Wheel wear per unit of work ground is constant regardless of wheel speed. It is the higher rate of output that makes for economy.

Rate of cut is increased by higher pressure, though an important limiting factor is strength of wheel. He drew attention to fatigue of the operator and emphasized that this condition must be guarded against if the greatest output is obtained. Closely allied with wheel speed and grinding pressure is proper selection of wheel grade. The softer wheel, under same pressure and speed, cuts and wears faster. When a softer wheel is employed to increase rate of cut, the speaker stated, the increase in the rate of wear is higher than that of the cut. Consequently, the time charge per unit of work diminishes while the wheel cost per unit of work increases.

Consider Power Supply

Long interruptions in power supply are more serious in the aluminum industry than in the steel industry because reduction pots are affected, it was stated in a paper by D. I. Bohn, electrical engineer, Aluminum Co. of America, Pittsburgh, and J. E. Housley, superintendent of power, of the same company, Alcoa, Tenn., presented at a session of the electrical engineering division.

Mr. Housley asserted that lightning is a problem from March to October at his plant in the South. Consequently, a relay scheme is employed for clearing out power lines during a lightning stroke. The company is going to more elaborate bus protection because of the heavy transportation of power.

Contributing a paper on vacuum tube control for steel mill applications, H. L. Palmer, electronic section, and H. W. Poole, steel mill section, General Electric Co., Schenectady, N. Y., explained that the vacuum tube is not a cure-all but it has its place in the control system. Greatest application is in the field of communication. Caution was given that some jobs under mechanical control should not be disturbed by substitution of tubes.

After reviewing basic principles of electronic tubes, the authors described various applications in the steel industry. They told of their employment in limit switches on sheet mills and in photoelectric pyrometers which at present are recording temperatures of radiant bodies in a range from 1400 to 3000 degrees Fahr. One of the newer uses of the tube is for flame control of bessemer converters by Jones & Laughlin Steel Corp.

They mentioned the detector for locating pinholes in black plate for tinning while the plate is traveling up to 1000 feet per minute. They told how the new Penetron gas filled tube is regulating voltage of chargers thus preventing overloading.

Tie-Up Conserves Power

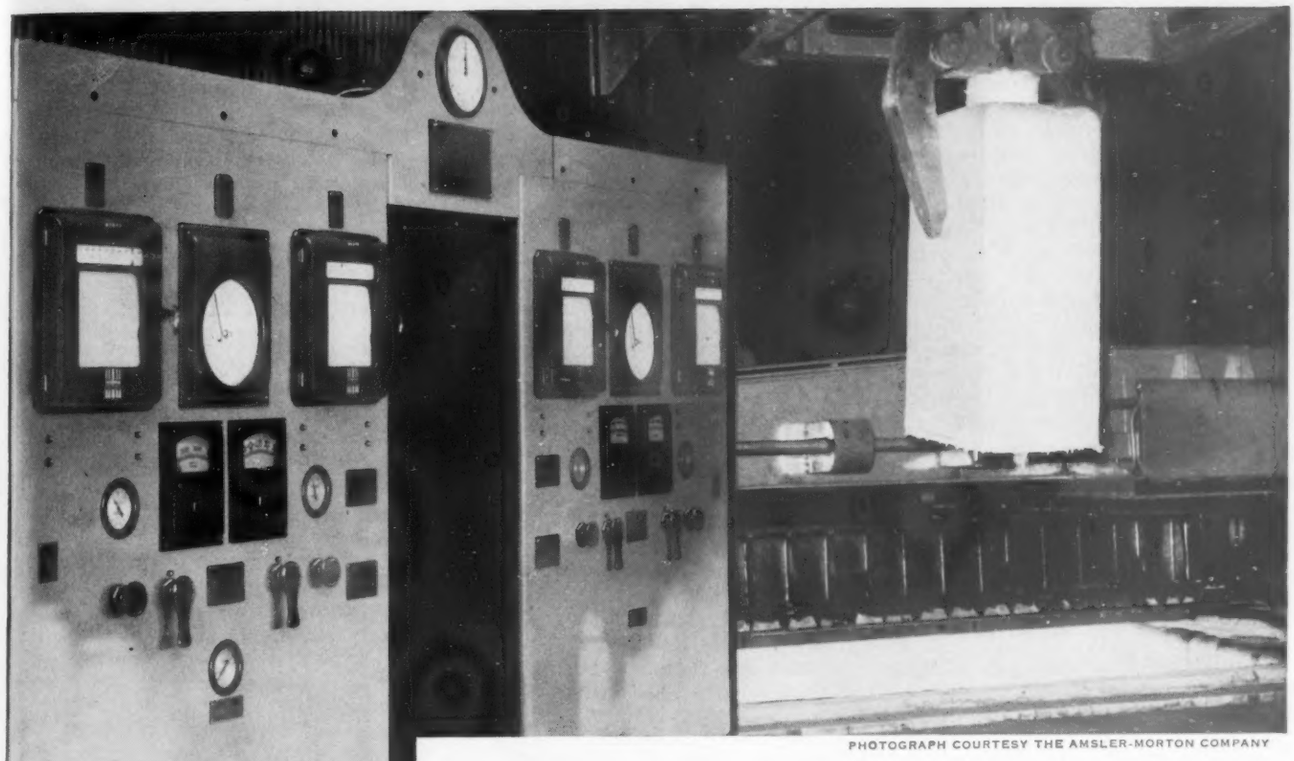
Tying together power facilities of all plants in the lower Monongahela district of Carnegie-Illinois Steel Corp. to permit peak loads to be distributed over all generating stations made possible operation of the new Irvin works without purchase of new equipment. This was brought out by W. B. Skinkle, secretary and engineer, Pittsburgh district power committee, United States Steel Corp.

Generating equipment of 60 cycles is more efficient than 25-cycle because of higher speed of the generator unit, he stated. Moreover, 60-cycle current offers better selection of motor speeds and affords more flexibility in design of steel plant equipment.

At a session of the welding engineering division, Dr. J. C. Hodge, chief metallurgist, Babcock & Wilcox Co., Barberton, O., discussed factors entering into setting up of stresses in welds. He emphasized that welding causes not simply stresses in one or two planes but that the result is a three-dimensional stress system. Various methods for measurement indicate internal stresses often equal yield-point values near welds, thus making stress relief essential for satisfactory performance of the weldment.

Dr. Hodge pointed out that there are various ways of reducing internal stresses. Suitable welding procedure has been developed and proved beneficial. A minimum of fused metal appears necessary as was demonstrated by results from a series of tests in which all factors remained constant except welding groove was progressively widened, resulting in added metal. In each case stresses increased.

Preheating up to 1200 degrees Fahr. also greatly reduces stresses, also causes a desirable decrease in



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They "see" what's going on in the soaking pits—

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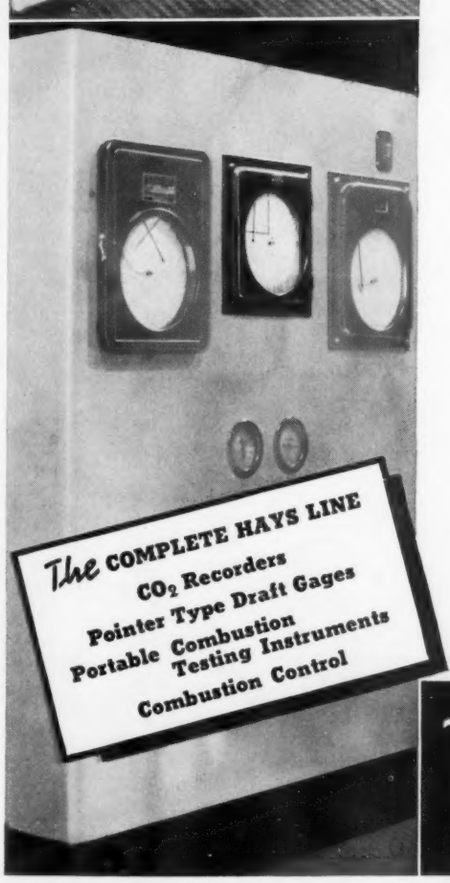
In the above installation a Hays "OT" Recorder (panel at the left) accurately records the gas pressure for every minute of the day and night. An Air Flow indicator (upper panel) shows continuously the air volume and flashes a warning signal when it reaches 25% of the load or lower. At the same time a Hays "D" Gage indicates the pressure *inside* the furnace. Thus is guesswork and uncertainty eliminated.

Hays Combustion Instruments have set the standard for accuracy, dependability and stamina for 38 years. They are as well known in the steel mills and power plants of the country as a monkey wrench. They can be designed to meet practically any requirement concerning indicating, recording and controlling of combustion conditions. Hays Engineer-representatives are located in all the principal cities to help industry in the solution of its combustion problems. They will be glad to serve you. Write to 960 Eighth Ave., Michigan City, Indiana.



The HAYS CORPORATION

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hardness of the affected zone. Residual stresses of 10,000 pounds per square inch are cut to 4000.

In many instances increase of only 50 degrees Fahr. in stress relieving temperature was found as much or more effective than doubling the heating period, especially with alloys. Hardness also is important. For instance, steel for high-temperature service containing 4 to 6 per cent chromium and 0.5 per cent molybdenum with a normal hardness of 150 brinell reached 350 to 450 brinell in the weld. Heating at 1300 degrees Fahr. for 4 hours resulted in little anneal. However, heating at 1600 degrees gave desired full anneal.

Of course, annealing results in some loss of tensile strength. However, this is usually small as a steel testing 55,000 pounds per square inch usually drops only about 3000 pounds.

Hardness and Stress Relief

In addition to reducing internal stresses, such treatment also has the beneficial effect of reducing hardness at the weld which may easily reach 320 brinell. When hardness is below 200 brinell, stress relief is seldom necessary. For hardness values from 200 to 250, stress relief may be desirable, and for hardness in the 250 to 350 range, it is almost always essential.

Equally as important as time and temperature is rate of cooling, according to Dr. Hodge. Especially when treating large vessels where a portion must project from an end of the heating furnace, temperature gradients must be watched carefully.

In comparing various methods of local stress relieving, he presented results of tests showing that although not quite as uniform heating was obtained, the desired stress relieving was accomplished successfully with oxyacetylene torches as readily as with electric induction or resistance methods. Another new method useful in treating uneven sections, such as certain pipe joints, is insertion of a silicon-carbide element inside the section which then also serves as the heating chamber, giving excellent results when insulated on the outside to hold heat.

Possibly significant advances lie in mechanical stress-relieving methods such as peening from both sides simultaneously, controlled vibration and other mechanical working. Such operations are aimed at elongating the weld, thus resulting in a degree of stress relief from the strains set up by contraction after welding. Data show that such methods could easily be extended to a point where they not only eliminate the tension stresses but set up compression.

An application of this method found successful is where boiler tubes are welded into header plates. Here stress relief is accomplished mechanically simply by expanding slightly the tube end in the plate.

Dr. Hodge emphasized that much yet is needed to apply mechanical stress relieving effectively as results depend entirely upon accurate knowledge of existing stresses.

In discussion, A. E. Gibson, president, Wellman Engineering Co., Cleveland, explained that stress relieving is not necessary in all weldments. Dr. Hodge stated that in pressure vessel work, code requirements considered plate below 1½ inches to be sufficiently flexible as to not require thermal stress relief. Another commentator pointed out that practically all welding work is done with plate ¾-inch and less thick, thus confirming belief that general stress relief of the great majority of weldments is not necessary.

Wray Dudley, assistant superintendent of maintenance, National Tube Co., McKeesport, Pa., reported results his company has obtained in a series of tests involving rail ends built up with the metallic arc, oxyacetylene flame and atomic hydrogen equipment. Metallic arc used with preheating of rail ends appeared best to date. Solid rail sections were preheated and peened while hot, little difference in various methods being discernible as yet. He said it was evident that solid rail welds cost 10 to 15 per cent more than splice bar joints, but indicated a good return from the added investment.

Work on repairing battered and low rail ends is successful but work must be watched carefully if costs are to be kept in line, according to Mr. Dudley. Rail head must have at least sufficient thickness for a year's wear if the repair is to justify the cost.

Welding with Multiple Arcs

A paper on automatic atomic hydrogen welding of steel, by J. T. Catlett, General Electric Co., Schenectady, N. Y., presented interesting cost data and detailed methods used to control variables encountered. Of importance is the new multiple-arc equipment using as many as 15 arcs. Welding data developed for the single arc, 3-arc, 6-arc, 10-arc and 15-arc equipment was given.

In his paper on welding electrodes, J. H. Deppeler, chief engineer, Metal & Thermit Corp., New York, reviewed requirements of electrodes and electrode coverings. In certain electrodes, alloying elements are added to give tensile strengths of weld metal ranging up to 100,000 pounds per square inch combined with elongations of over 20 per cent in 2 inches. Others are especially designed for combinations of hardness, corrosion resistance, cavitation resistance, creep strength, low temperature impact values and resistance to fatigue.

In thermit welding of forgings, he pointed out how this method had been used satisfactorily, forgings tested to destruction showing failure completely outside the welded area as often as in or near to the weld.

No Soft Pedal in This Iron, Steel History

■ *Iron Brew*, by Stewart H. Holbrook; cloth, 352 pages, 5¾ x 8½ inches; published by the Macmillan Co., New York; supplied by STEEL, Cleveland, for $2.50.

The author of *Holy Old Mackinaw*, the story of big timber, has here presented the story of the great lakes iron ore fields from their commercial beginnings to the present day. Following this comes the better known history of steel, Bessemers, barons, the birth of Big Steel, and the Corporation.

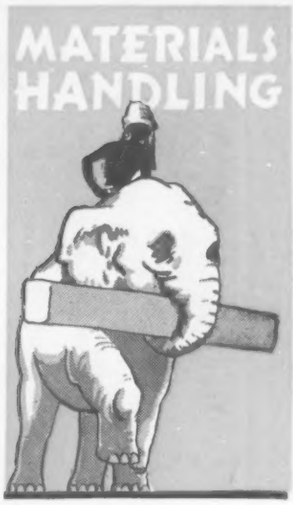
No attempt is made to record chronological development. Instead, the tale is presented through pen pictures of the pioneers, their life, environment and the events of each cycle. The changes in methods, men and machinery are described from the crude stage to the highly technical and mechanized industry of today.

This is particularly true of the first part of the book, devoted to ore. In the second half the struggles of steel are depicted, the Kelley-Bessemer controversy is revived, the heroes of steel portrayed and labor is alternately praised and damned. Of course, the steel barons are excoriated and their exploits exposed. The names you have heard, and some you haven't, are mentioned here, from the Merritts to Gary. Incidentally it is interesting to note that one of the last of the Merritts recently passed on to other explorations (STEEL, Sept. 25, p. 41).

For those who like their romance salted, their history characterized and their technicalities dramatized, this book will provide ample satisfaction.

New Enamel for Concrete

■ An enamel finish for use on concrete floors, dadoes, firedoors, machinery, pipelines, etc., has been placed on the market by Baer Bros., 438 West Thirty-Seventh street, New York. Known as "Baertex Floor and Dado Enamel," this new finish can be used on any interior surface subject to abrasion. It is furnished in battleship gray, has coverage of approximately 500 square feet per gallon and dries overnight to a hard, glossy finish.



Sheet Packs

New high lift, heavy duty fork truck handles large sheet packs up to 12,000 pounds in weight. Loads 101-inch packs into 106½-inch cars. Mast height of 96 inches provides 58-inch lift on forks of unit

■ LOADING and handling of heavy sheet packs presents a problem in many mills. In Jones & Laughlin Steel Corp.'s strip mill at its Pittsburgh works, a new, heavy weight, heavy duty fork truck has recently been obtained to facilitate such operations as those shown in accompanying illustrations. Furnished by Yale & Towne Mfg. Co., 4531 Tacony street, Philadelphia, the new truck will handle sheet packs up to 12,000 pounds in weight.

In Fig. 1, a 10,430-pound load, measuring 70 x 72 inches, is shown being lifted on the 72-inch forks of the truck. In entering the freight car here, load end is run in first. Because of the extreme weight of the truck, thick steel floorplates are used both as runways and also as covering of box car floor to prevent

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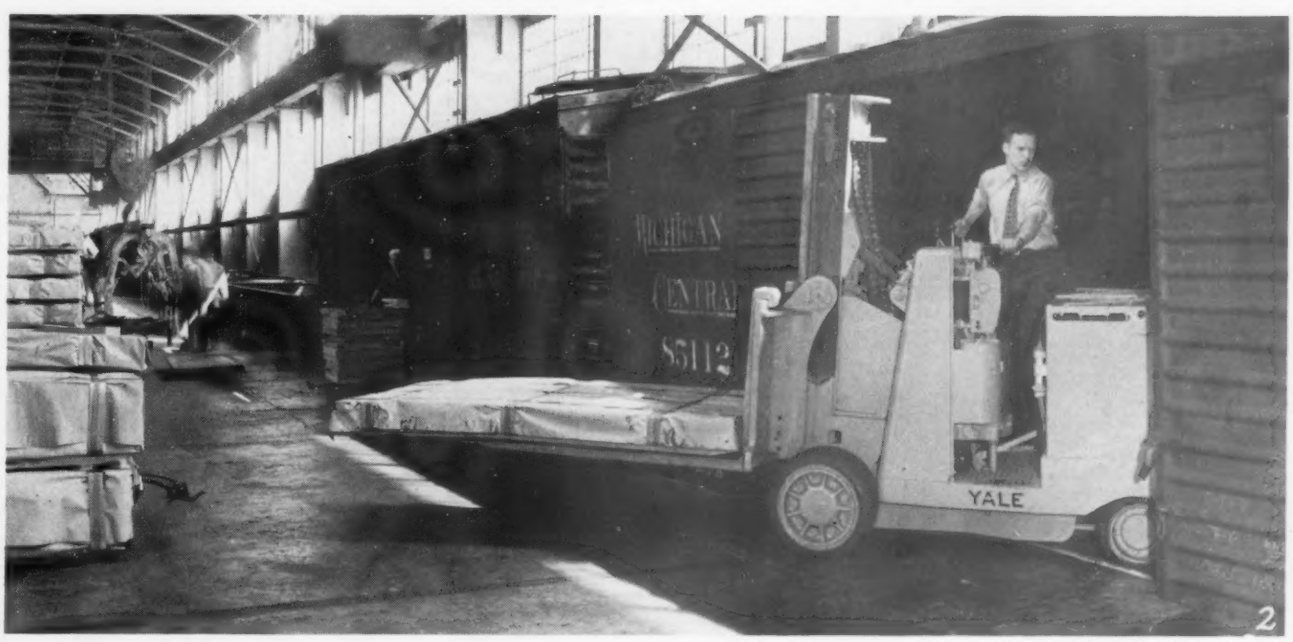

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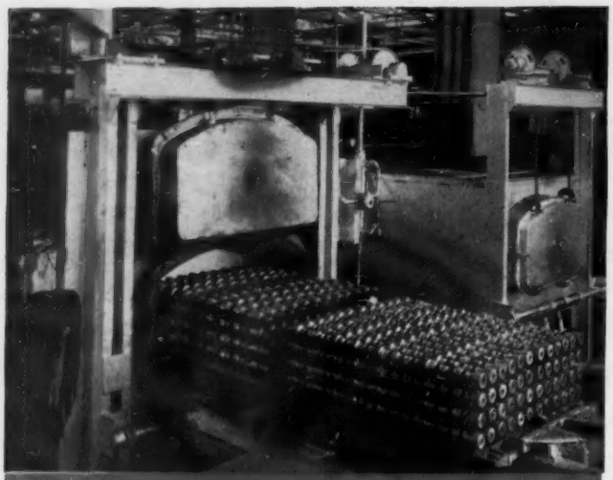


Carburizing camshafts in a modern automobile plant.

Fabrication by welding.

NATIONAL METAL EXPOSITION

INTERNATIONAL AMPHITHEATRE CHICAGO

OCTOBER 23-27

PARTICIPATING SOCIETIES

American Society for Metals
Wire Association
Institute of Metals Division, A.I.M.E.
Iron and Steel Division, A.I.M.E.
American Welding Society

METAL SHOW ISSUE OCT. 16th

Studying metal structure microscopically

Electro-galvanizing wire at the rate of 578 miles per day.

Open-hearth pouring.

■ The latest methods, materials, equipment and metals will be on display when the twenty-first National Metal Congress and Exposition is in session at the International Amphitheatre, Chicago, Oct. 23 through 27. The papers presented at the business sessions will reflect the best thinking and most exhaustive research done over the past year. This is truly the "metal man's" greatest opportunity for an interchange of ideas and to learn of the latest developments.

Following its usual custom, STEEL will devote a large part of the October 16 issue to the same interests as the various societies participating in the National Metal Congress. This issue, dated just a week prior to the opening of the show, will carry complete advance details so that you can lay your plans as to the papers you wish to hear, the things you wish to see and the booths you would like to visit.

Our October 16 issue will contain a combined advertising and editorial insert section printed in two colors on special coated stock. This insert section will carry the complete program and list of exhibitors. In addition, it will feature pertinent comments by men known and respected throughout the industry. It will have a profusely illustrated section depicting the progress and achievements of the past year.

The advertising pages will inform you of the newest money saving equipment; of better methods; of improved materials and metals. If you attend the show, STEEL'S October 16 issue will help you to profitably plan your time. If you can't attend, this issue will bring the show to you.

Companies supplying equipment, materials, methods or metals are invited to write for information relative to advertising possibilities.

STEEL

PENTON BUILDING · CLEVELAND

wheels from going through floor.

In order to carry high lift, heavy weight loads, the truck is weighted by placing the battery at extreme rear and by using additional lead counterweights when necessary. The truck is a front wheel drive, rear wheel steer unit.

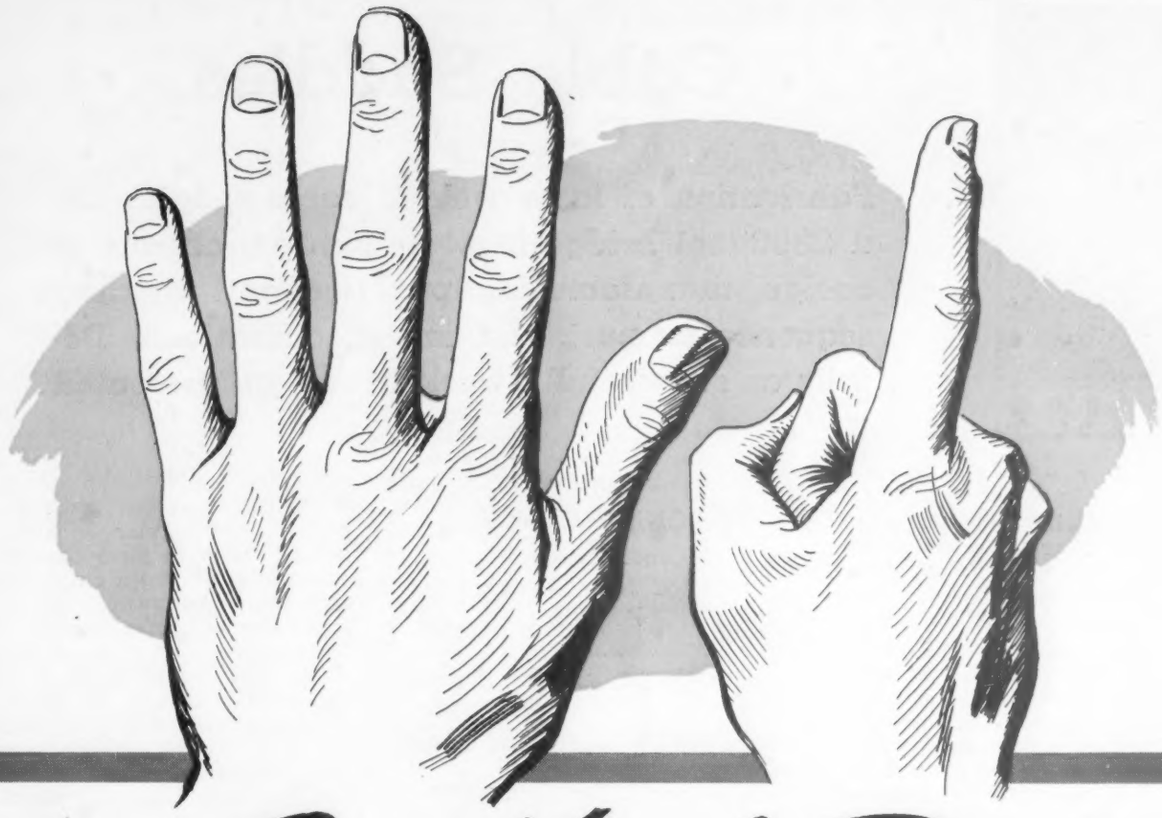
In Fig. 2, the truck is shown equipped with medium-length removable forks. Three lengths of forks can be used with this unit—36, 72 or 108 inches in length. Besides being detachable, the forks are adjustable sidewise so that this unit may also be used as a ram truck by setting both forks in the center.

(*Please turn to Page* 68)

Increase Aluminum Wear Resistance

■ Under patent No. 2,157,155, assigned to the Aluminum Co. of America, Gulf building, Pittsburgh, a new treatment for aluminum pistons is described. This is an anodizing process followed by an application of deflocculated graphite said to prevent wear and scuffing. In a particular application of this treatment the pistons were machined, cleaned and immersed in a 15 per cent sulphuric acid electrolytic bath. Pistons were connected as anodes and a potential of 23 volts applied for thirty minutes with a current density of 11 to 12 amperes per square foot at bath temperatures of 75 degrees Fahr.

After thorough cleaning and drying, the pistons were coated with a solution containing one part of 25 per cent of sodium silicate (water glass) having a ratio of silicate of soda of 3.25 to 1 mixed with two parts of a solution made by diluting concentrated "Aquadag" with 3.5 volumes of water. This solution was allowed to stand on the pistons until dry and then heated to 230 degrees Fahr. for an hour to complete the drying. After 65,000 miles of service, which varied from hot to cold, the motor was torn down and examination showed the pistons to be in excellent condition as far as surface was concerned and exceptionally free from scuffing and wear.



The *Six Vital Points* in Steam Cylinder Lubrication

Under today's high working pressures, the oil must atomize properly at the quill. No carbonizing, no drooling; complete dispersion. Shell Steam Cylinder Lubricants meet this point.

The steam must be saturated with the oil to form a tough, water-resistant film. Score another point for Shell Steam Cylinder Lubricants.

The oil must insure constant free action of the valves. Shell Steam Cylinder Lubricants are *tops* on this point.

The oil must have the ability to separate quickly from the condensate. There's no boiler foaming with Shell Steam Cylinder Lubricants.

The oil must be stable, neutral, noncorrosive and uniform in quality. Shell Steam Cylinder Lubricants—tops again!

The *right oil* isn't the only consideration. Competent technical service is vital also. Shell's lubrication staff, backed by unequaled laboratory and research facilities, completes the picture. Let Shell show you how effective this combination can be.

SHELL Steam Cylinder LUBRICANTS

SHELL WOLCO OIL • SHELL SPELTA OIL • SHELL VALVA OIL
SHELL MARINE ORZA OIL • SHELL MARINE DORSATA OIL

SHELL

Cable Saddles

Fabrication of large welded cable saddles for a 2800-foot bridge involves many problems in design, manufacturing practice and welding sequence to meet exacting specifications. Details as successfully worked out are presented

By JONATHAN JONES
Chief Engineer
Fabricated Steel Construction Division
Bethlehem Steel Co.
Bethlehem, Pa.

■ POSSIBLY the cable saddles of the Tacoma Narrows bridge represent the first use in the United States of welded structural plate for these heavy and rather complicated pieces.

This 2800-foot span highway bridge carries a 24-foot wide, reinforced concrete roadway slab, and it requires two parallel-wire cables, each 17 inches in diameter. Vertical reaction of each cable upon its saddle, from dead and live loads, is 10,800,000 pounds. Each cable is to be spun in 19 strands, and each strand will be spun outside the saddle and transferred into it when completed.

As on the Golden Gate bridge, a cross section of the cable before compacting will show the 19 strands in a hexagon with its apices up and down. The hexagon however will not be quite regular, as measures will be taken to place the strands so compacting into a circle will require less displacement of wires than in the case of a true hexagon. This feature accounts for the novel shape of the cable trough in the saddle as shown in the cross section Fig. 5 and other accompanying illustrations.

One of the major problems in the saddle design was the transfer of each cable load to all principal elements of its tower leg. The tower legs are cruciform, four square steel shafts being assembled to form a cross of five cell spaces as shown in Fig. 3. The width over the tower web plates, transversely of the bridge is 13 feet 1½ inches (originally 11 feet 7½ inches) of which 3½ feet is width of central cell.

At one stage it was proposed to make the saddle a casting 3½ feet in width, or as wide as the central cell, and to load the remainder of the column top by means of a transverse grillage. This grillage, however, was difficult to design in any reasonable depth, since its deformation would defeat the purpose of fully loading the outermost column webs. A saddle with ribs extending out 5 feet 10 inches to each side proved too deep and heavy to be practical.

Diaphragms Distribute Load

A compromise was adopted, whereby the saddle width was made 10 feet, leaving part of the two lateral column cells not covered. Deep diaphragms built into these cells, at the extremities of the saddle, served to distribute loads satisfactorily over the remainder of the column material.

This determined a saddle cruci-

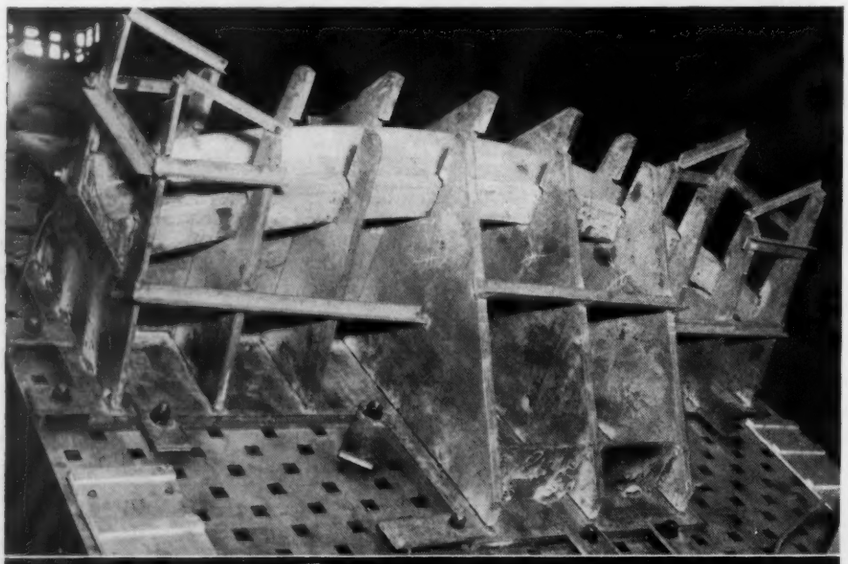


Fig. 1. (Upper)—Saddle fitted up for welding of ribs, trough slab and base plate. Fig. 2. (Lower)—Closeup showing welding grooves for trough side plates

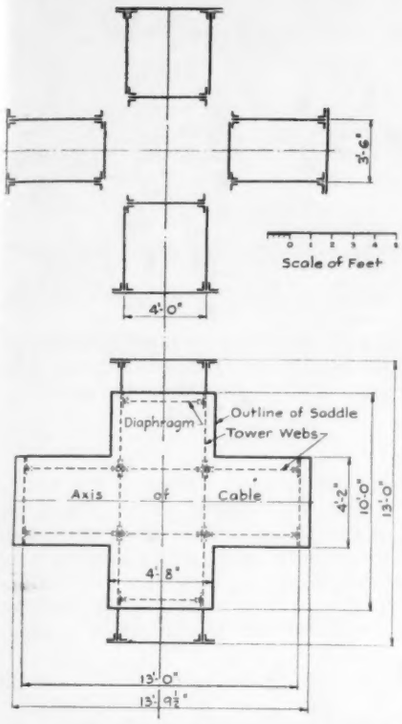


Fig. 3—Plan view of the four tower cells as shipped is shown at top. Below is plan of assembled cells and outline of saddle

form in plan, 10 feet wide over the central third of its length and 4 feet 2 inches wide fore and aft. See Fig. 3. The 10-foot width necessitated a depth slightly over 3 feet from bottom of cable trough to under side of saddle. The saddle length of 13 feet 9½ inches conformed to the tower design and gave a satisfactory bearing pressure for the cable wire in the saddle trough.

Weldments Justified

At this stage the decision was made, without making comparative cost estimates, to weld these saddles instead of casting them. There were several valid reasons. The metal is of radically varying thicknesses, which has made for difficulties in securing sound castings on other bridges. The pattern is quite costly. The amount of money tied up in the chance of losing a casting through mishaps is large. The time element seemed to favor the weldment. And finally, if one casting should be rejected, the time required to replace it would wreck the schedule for completion of the bridge.

Another factor would have interfered with the use of castings, but could be overcome in the case of weldments, namely the machining of the cable trough. It has been customary to set the castings on a side in a boring mill and sweep them on a circular arc past a fixed tool stand. At the time this bridge was fabricated there was no boring mill known to be available that had sufficient height to accommodate these 10-foot wide pieces in the up-ended position. This fact not only eliminated castings of the adopted cruciform shape, but it had a major influence on the welding procedure as given hereafter.

In the cross-section, Fig. 5, the elevation, Fig. 7, and the plan, Fig. 6, all details and all dimensions have been eliminated except those defining the main elements of the piece and the main welds. All covers, gaskets, end hoods, beacon supports and hand-rope attachments have been eliminated as not pertinent to the present description. The sequence of manufacture was as follows:

The cable trough rolled slab, 8 inches thick, was curved at a low red heat to a 16-foot radius under a 7000-ton hydraulic bending press. This can be seen clearly in Fig. 1.

The 2-inch vertical stem piece was machine flame cut at its upper edge both for radius and for double Vee bevel, the depth being oversize.

The stem was welded to the underside of the trough slab (weld A, Fig. 5) with a full reinforced butt weld.

The T-section thus formed was rough machined for the slab sides and the cable trough. For this operation, the four Tees were up-ended so trough and stem piece lay in a horizontal plane and were mounted inside the track of a floor-type boring and facing mill, ordinarily used for machining tunnel lining segments. A tool carriage traveling 360 degrees on the circular track then cut the external circular work on the four trough slabs.

The T-sections then were stress relieved. The maximum change of dimension found to result from this treatment was 1/16-inch. This was the only stress relief given to any part of these saddles. For weldments of such size a final stress-relief would seem to some designers to be advisable; stress relieving would however have carried with it as a corollary, a final machining to accurate dimensions, and this could not be accomplished on any available equipment for the reason stated above. However it is believed that for the nature of service to be performed by these saddles, a general stress relief is not important. What is important, is that the dimensions of the trough, once established, be not greatly warped by subsequent welding.

T-sections were taken back to the boring mill and given their final machining. This was somewhat exacting, as at each end of the circular arc there are run-off curves of shorter radius, not shown in Fig. 7, producing a flare in the horizontal as well as the vertical plane. This final machining included the grooves for

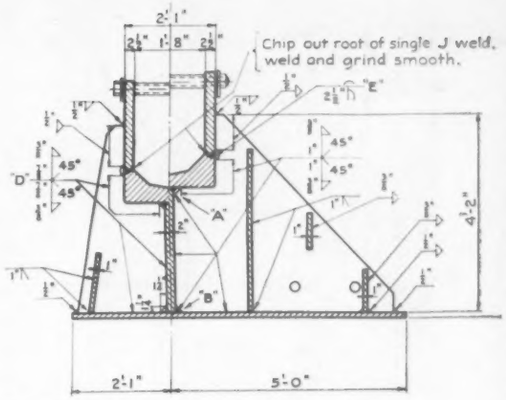


Fig. 5—Left portion of above shows half section through saddle at B-B, Fig. 7. Right portion is section at A-A, Fig. 7

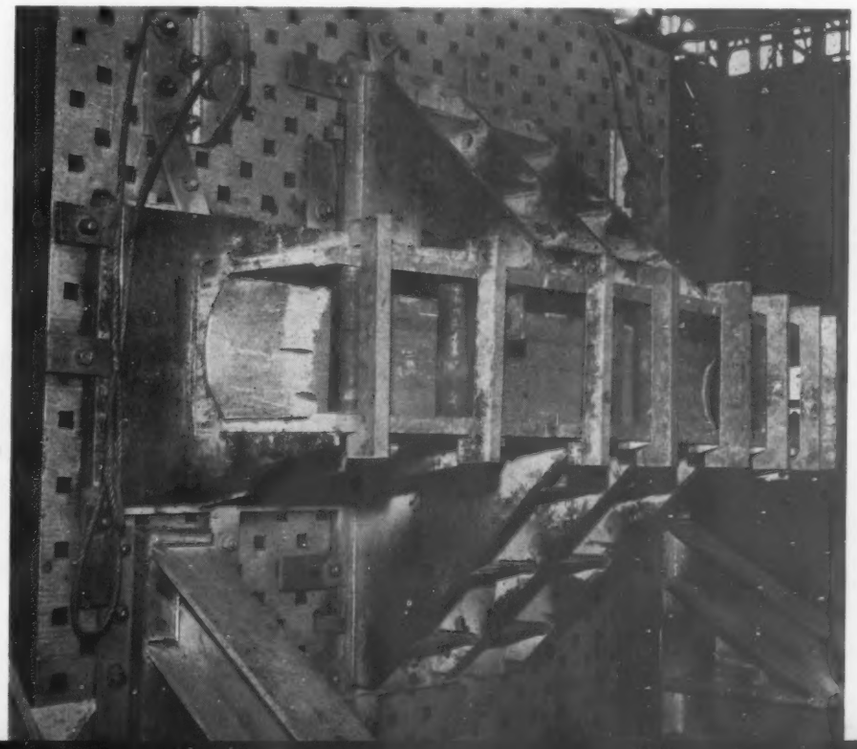


Fig. 4—Saddle positioned for down welding of trough side plates

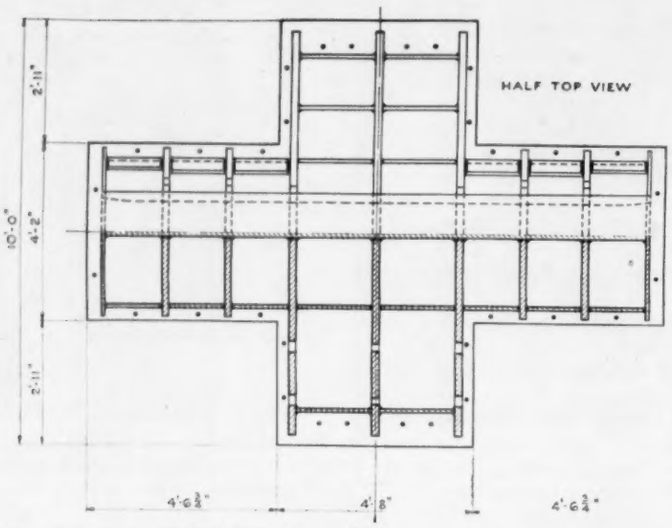


Fig. 6—Upper portion here is a half top view, lower portion a half horizontal section

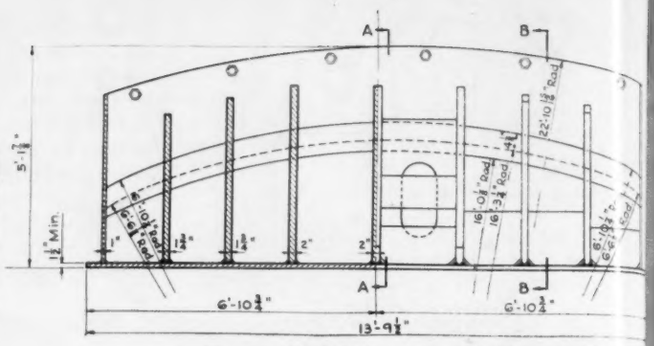


Fig. 7—At left here is a half vertical section, at right a half elevation. Sections at A-A and B-B are shown in Fig. 5

the side welds shown as in E, Fig. 5.

Bottom edge of the stem piece was machine flame cut and double-Vee beveled for the full butt weld to the base plate, weld B, Fig. 5.

The 1½-inch base plate (10 x 13 feet 9½ inches) was ordered 2 inches thick to allow ½-inch for a final bottom cut. This also permitted waste from base plate to be used for some of the 2-inch thick bracket plates. The base plate was furnished flattened at the mill and was not premachined before assembly.

This plate was solidly bolted down to a 10 x 15-foot x 9½-inch cast steel surface plate weighing about 44,000 pounds which in turn was mounted on a trunnion device for positioning the welding. See in Figs. 1 and 4.

The preassembled Tee of cable groove and stem piece was mounted on the base plate and tacked, Fig. 1. All transverse bracket plates, nine on each side, were flamed tailored to fit around the Tee in the right relationship and with the proper groove for welds D; also along the base slab.

These were, it will be noted, full Tee butt welds with reinforcement. In the case of the wider brackets reaching out to the 10-foot width, horizontal shear is developed between bracket and base of an intensity requiring this full butt weld; for the narrower brackets, the computations indicated that fillets would suffice but butts were used to keep all joints of the highest standard. At this stage of erection the vertical 2½-inch side plates enclosing the trough were not placed; the uppermost part of the bracket plates was purposely shaped to extend somewhat into the space which these side plates would later occupy.

Welding was now commenced at the bottom and brought up toward the trough, to minimize shrinkage pulls on the latter. Welds were positioned, and flat-position high-heat electrodes used. Most of the heavy welds were made in step-back sequence, the full number of passes being built up in short lengths with intervening gaps for later enclosure. The resulting assembly showed no distortion of the machined cable groove.

A cutting torch on a track now cut the upper ends of the side bracket plates to the exact vertical plane of the outside face of the 2½-inch vertical side plates.

Side Plates Heavily Braced

The side plates then were tacked in place and welded. They were heavily braced across and also were supported by tops of the side brackets. Because this was a 2½-inch unsymmetrical weld (weld E, Fig. 5), it was the one considered most apt to produce unmanageable warpage; the maximum variation across tops of the side plates was, however, the negligible amount of ⅛-inch. The cover plate, not shown in the figures, was tap screwed in place without difficulty from this warpage.

Final assembly operation was to insert longitudinal stiffening plates between the transverse bracket plates and to connect them with fillet welds. These end fillets, being of 1-inch leg, exerted considerable pull. At top of the wide brackets, they pulled the latter in slightly, this being the only spot in the entire assemblage where any warpage is observable by the naked eye.

Warpage of the bottom of the base slab was much less than had been allowed for, and a 3/16-inch cut brought all into a plane. The extra 5/16-inch of height is negligible on top of a 450-foot tower.

The width of 10 feet interfered somewhat with the intended positions of the temporary footwalk ropes for cable construction. There-

(Please turn to Page 68)

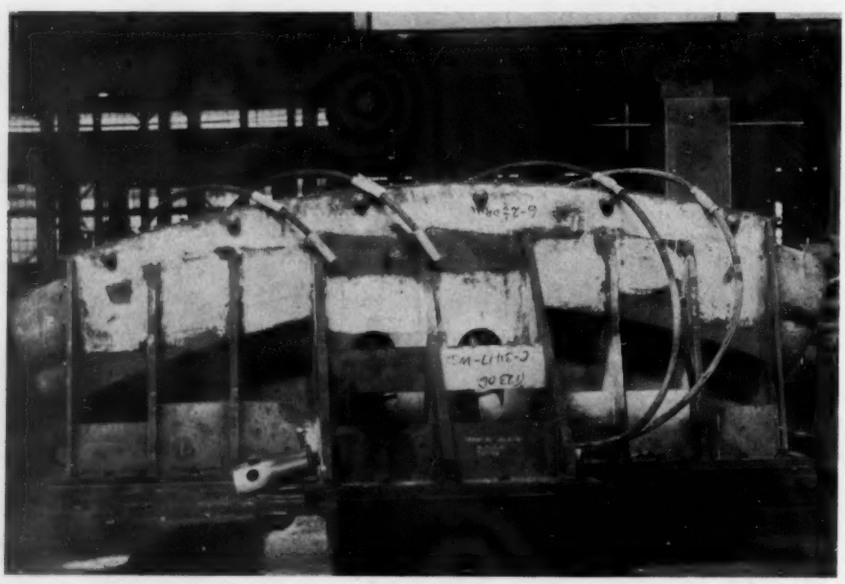
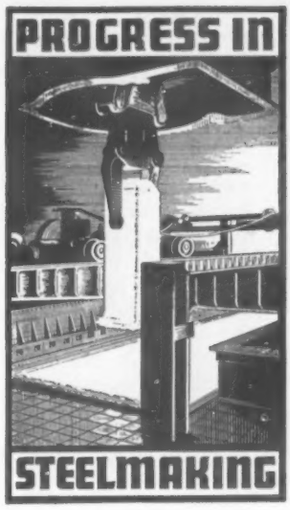


Fig. 8—Side view of completed saddle. It weighs 15 tons as shipped



"Tin Walloper" Passes

Here an old timer, one who has worked in steel mills all his life and has come up through the ranks, takes a look back over the years and reminisces a bit on things then and now

By E. W. BOYDEN

■ A STEEL MILL engineer is dreaming; the dreams which are the basis of the great changes which sweep industry. His thoughts grow apace and multiply. Other dreamers join him in the thinking out of great things as yet untried.

There is feverish haste in the drafting rooms. Foundries and machine shops work overtime on new and untried mechanical devices; gigantic housings and mammoth rolls spring into existence; new electrical equipment of unheard of capacity is evolved.

Impossible Again Accomplished

Long sheets of steel, seemingly endless, pass through this equipment under a pressure of millions of pounds. The impossible has again been accomplished—the aim of these men of great vision is realized. The cold reduction of strip steel to light gages is achieved and the whole business of making tin plate is revolutionized.

With this change is heralded the passing of the tin walloper, one of the most colorful of the old time craftsmen.

The tin walloper, or skilled hot mill worker, holds a unique place in industrial life. Long after other old trades have become obsolete, he retains his place on the stage of production and still plays an active part in the manufacture of tin plate.

Through the past 40 years, there have been slow changes in hot mill practice; from the 5-part system through the 4-part, the 3-part, the double mills and finally the strip finishing mill system, which reduces hot rolled strips to light gages.

The original 5-part system consisted of roughing down one bar (1st part), reheating, rolling and doubling (2nd part), reheating, rolling and doubling again (3rd part), reheating, rolling and doubling the pack now with four sheets (4th part) and finally, reheating and finishing or drawing the pack of eight sheets to the required length (5th part).

There were some variations of this practice according to different gages. This, in 1895, gave way to the 4-part system which combined the first two parts through the use of two light bars having the same weight as the original one bar. Next, came the Cleveland or 3-part plan which combined roughing and double rolling without reheating. Then as a natural sequence, came the double mill plan of operations. The combination of roughing and double rolling was done on one mill and the other two parts on another or finishing mill.

In the meantime, great strides had been made in the rolling of hot strips. This process, through a set of ten consecutive mills, reduces slabs from 3 to 4 inches thick to about 16 gage, the thickness of sheets in a pack of fours before rolling.

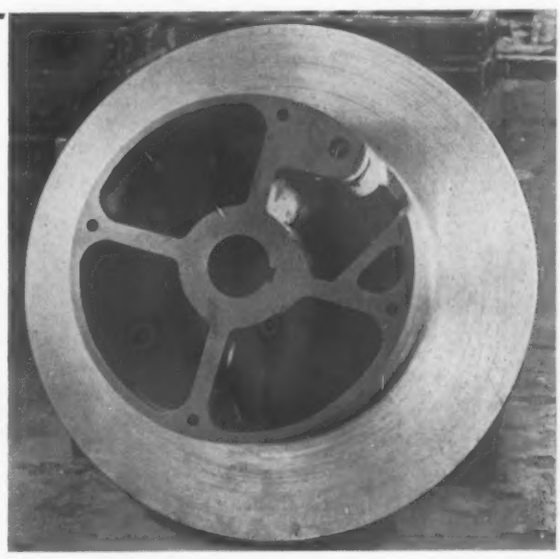
So, the way was now clear for the first really radical departure from the old time hot mill practice. This was the adapting of hot mill practice to the finishing of hot rolled strips. The strips from the continuous roughing mill, about 190 feet long are cut to a suitable length, doubled and sent to the hot mills. Heating these strip fours necessitated a complete change in the manner of heating and this brought in the continuous sheet furnace. With this exception, the work on the strip finishing mills is done in much the same way as the double finishing mill.

And now, the crowning achievement of all—cold reduction mills.

The strips from the continuous roughing mill are reduced cold in single sheets to light gages. Of course, these mills have gone

Wire Block

■ **This large wire block with 26-inch diameter drum and 42-inch diameter flange was cast of Meehanite metal by Rosedale Foundry & Machine Co., 1731 Preble avenue, Pittsburgh. The block, to be used for drawing wire to small sizes, was heat treated to a hardness of 400 brinell to prevent cutting at rim. Illustration courtesy Meehanite Research Institute of America Inc., 311 Ross street, Pittsburgh**



through various phases of evolution, too. The most up-to-date equipment at present is a series of cold mills operating in tandem.

Some idea of the tremendous strides that have been made in production can be realized by watching this tandem mill reduce one coil which weighs between 5000 and 6000 pounds. This takes comparatively few minutes but 35 years ago when the limit on production was 5250 pounds, this was an 8-hour turn.

The advantages accruing to the steel worker and the consumer from these giants of production are of far reaching importance. For one thing, the net result of utilizing the vast resources of man's mechanical servants is invariably to increase employment. Illustrative of this is the fact that between 1926 and 1937, employment increased 28 per cent with the companies operating continuous mills. This is 3 per cent more than shown by those companies not having this new and up-to-date equipment.

Higher Quality Produced

Then, too, the higher quality steel produced in such large quantities opens up a newer and bigger steel market that is boundless in its possibilities.

The automobile business with its huge payroll is a good illustration. Who can imagine every fourth person in the United States owning a car if made by the painfully slow, tedious and expensive methods of 30 years ago?

The same epoch making developments are now characterizing our own industry.

To those of us who have witnessed these changes, who have had the tongs in our hands, who have felt the intense heat of the packs and the rolls on hot days, this transition has a peculiar significance. It will mean, for one thing, the passing of hard labor, for the tin walloper has many times to work to the very limit of his endurance; and it is ever the prerogative of machinery to lighten the labors of man.

All tin workers will recall the "tough" turns; maybe the screws would stick; maybe there were hot necks with the wind blowing the smoke back in the face; perhaps the weather was so hot that the tips of one's ears seemed to scorch.

But time has a habit of throwing a veil of forgetfulness over the rough spots and the things most likely to stick in the old-timer's mind are the pleasant parts. He will remember the big turns, the fascination there is in working with red hot steel, the working up of a crew to the efficiency of a well oiled machine and the real satisfaction which results from hard and difficult work well done.

Those Good Old Jokes

Then, too, there was a great deal of rough fun in the old days which provided relaxation from the hard work. Much, if not all, of the practical joking has been stamped out in the interests of safety. But many an old-timer will laugh and chuckle every time he thinks of some of the harmless tricks that used to be played. There are many who will remember being sent to an end mill for a bucket of back lash and there being gravely informed that they had urgent need for every pound of back lash they had. And the mill with the close bearings must not be forgotten. The newcomer had it explained to him that the bearings were so close that they could not work much longer unless he would go to mill so-and-so and get their bearing hook. This hook, he was told, would pull out the bearings so they could go ahead.

Long after the last hot mill has become scrap iron, there will dwell in the mind of the tin walloper a rich and fertile field of memories which needs, perhaps, but an association to set it in motion. To the writer, for example, the smell of hot mill grease boiling invariably brings to mind a pathway between old Twenty-two and Twenty-three with the grease house to the north. The arrangement of this plant has been much changed, perhaps even the grease house has been moved. But this mental picture is still bright and unclouded, and the smell of hot mill grease boiling always brings back that pathway and those crews of 25 years ago.

Yes, and the old Nordberg and Montpelier engines that with gasps and wheezes pulled these mills—that is, they pulled them if too many weren't in at the same time. When this occurred, the engine stalled and raucous shrieks of the whistle would summon the crane to pull the aged relic off dead center.

Ah, those old days; the days of youth for those tin wallopers who are today aging and graying. The days when their muscles swelled and snapped with pent-up energy; when with buoyant spirits and elastic step they partook eagerly of the joys of hard work and hard playing; the days so long ago that they could not, then, look forward through the long vista of years and see the passing of their trade.

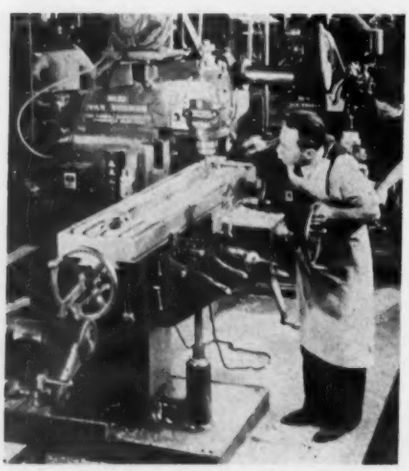
To those who feel sadness at this evolution there must come the realization that this is industrial progress as applied to the manufacture of tin plate and that the cold reduction of steel sheets has come to displace hot rolling just as surely as the horse and buggy was displaced by the automobile as a means of transportation.

"The Moving Finger writes; and having writ,
Moves on:—"

Soon, the last heat will have been rolled, the last pack measured and "ALL OUT" will be called, for all time, for the tin walloper.

♦

Versatile Miller



■ **Swiveling cutterheads on this milling machine at plant of Synthane Corp., Oaks, Pa., eliminate special angular cutters and permit operators to get any angle on work without special tooling. The machine, made by Van Norman Machine Tool Co., Springfield, Mass., has a 38-inch table movement and is used to machine a large variety of plastic pieces**

Makes Aluminum Wool

■ According to Springfield Metal Wool Co., Springfield, O., a method has been developed that will successfully produce wool from aluminum. The wool is made in long fiber strands of ribbon form from very fine to coarse grades in both hard and soft wool; since it has 3 times the bulk of steel wool it is comparable to steel wool in price. Being rust proof, the wool is suitable for water and steam applications. Among uses for the wool are: For cleaning and where steel wool is too abrasive; for filter pads on air, liquid and dust equipment; to mix with other substances to improve wear resistance, thermal conductivity and appearance; in rope form for caulking, etc. The aluminum wool also is acid-resisting and will take an anodic coating.

New Cladding Method Holds Possibilities

(*Continued from Page* 43)

sheets, the electrical resistance is increased, thus developing the heat in the alloy sheets where it is needed for satisfactory welding.

The machine used to produce this material at present employs two sets of welding heads, each head having a pair of electrode wheels. This machine is capable of producing 10 square feet of clad surface per hour. This amount can easily be increased by addition of other welding heads.

This new cladding method is applicable to practically any other weldable alloy which can be rolled to sheet form. Thus, the method may have far reaching possibilities in the cladding field.

Vessels in service and many tests made on clad plates produced by this new method show that a perfect bond is obtained over the entire surface of the plate, that the bonding is permanent, and that it has a high thermal conduction efficiency.

First Cost Economical

Other advantages of the method are that it is economical in first cost, the alloy lining is a constant known thickness over the entire surface, bond has high resistance to failure from repeated heating and cooling, ductility of alloy is preserved, base metal can be normalized by heat treatment, and full corrosion resistance of the alloy can be made available.

Already the method has been applied to making the various chambers shown in the accompanying illustrations and many other products. Clad material made by this method is available in plates as large as made by steel mills. Large plates are surfaced by this method using comparatively narrow sheets of stainless. After the entire surface of each plate has been welded to the plate, see Fig. 5, adjacent stainless sheets are welded together by hand using stainless electrodes to produce a continuous corrosion resistant surface. Fig. 5 shows a 10 x 38-foot plate. This new product, called Babcock & Wilcox Croloy Bonded plate is expected to find increasing application in all types of processing vessels.

To determine the effectiveness and completeness of the bond produced, a wide number of tests were made. Fig. 2, for instance, is an illustration of this strength. Using a flat-bottom drill, holes were made through the base metal from the base metal side of a bonded plate, just to the metal cladding. Drilling was stopped at the junction line between the alloy layers and the steel plate. Then a square-nose punch, slightly smaller than the holes in the plate, was inserted and forced against the cladding with a result shown in Fig. 2, a view from the clad side, and the cleanly cut holes are evident. With only ½- or ¾-inch ligaments between the holes, the alloy did not pull away from the plate but broke clean around the holes.

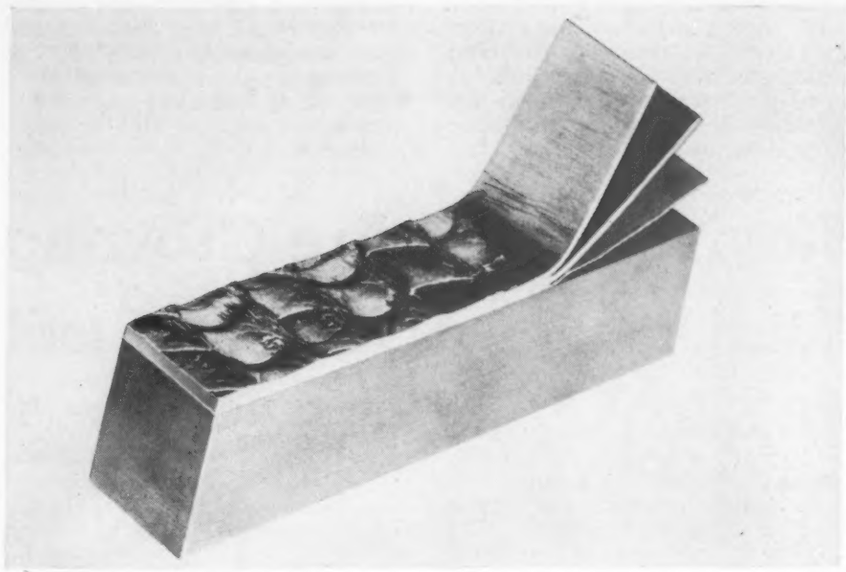


Fig. 4—When resistance welding, a perfect bond is assured by using three thin sheets, thus developing the welding heat at the points desired

Allows Fillet Welding

This great strength of the bond between alloy and base metal is particularly important in pressure vessels such as bubble towers and fractionating columns that have trays and other internal fittings. Such parts now can be fillet welded directly to the alloy lining using alloy weld metal without necessity of punching holes in the lining and welding the internals to the base metal. Fig. 1 shows a number of these internal fittings welded on the inside of an alloy-lined vessel.

Fig. 1 shows a most severe test, a large chip taken when making a heavy cut directly through both clad and base metal. It will be noted there is no separation of the alloy from the base metal, even under this rigorous treatment.

Bond Holds in Spinning

Further evidence of the complete bond produced has been provided by spinning such items as the drum head shown in Fig. 3. This 12-foot diameter head was subjected to severe working in forming the curve shown. Even under such severe forming, no stripping or movement of the clad surface was experienced.

Importance of the new method in producing satisfactory clad plates for vessels is apparent when it is considered that practically every processing industry today requires corrosion-resistant material.

Also, practically every chemical process now is employing increased pressures and temperatures to speed up reactions and thereby increase efficiency of the processing and get better yields. Such increased temperatures and pressures are directly contingent upon availability of equip-

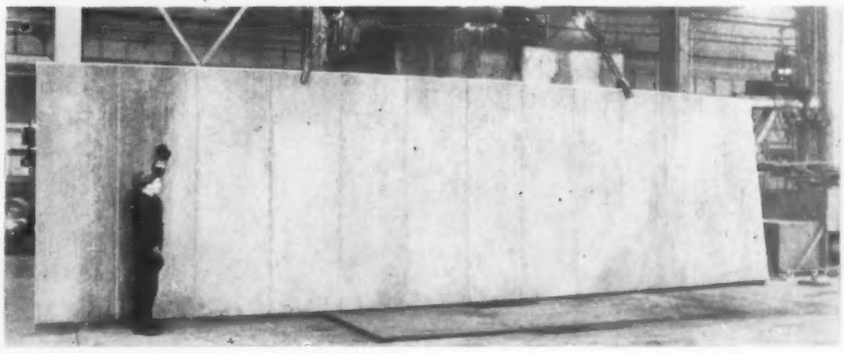


Fig. 5—This large 10 x 38-foot Croloy bonded plate $1\frac{1}{16}$ inches thick is an indication of the size in which these plates are produced

ment which will give satisfactory life. Even a small increase in temperatures and pressures has been found to accelerate corrosion so greatly that materials formerly satisfactory had to be discarded after only a few months' operation. This has focused attention upon a satisfactorily clad heavy plate material such as now made available by this cladding process. Here is offered a means of counteracting corrosion at a comparatively low cost and with certain results.

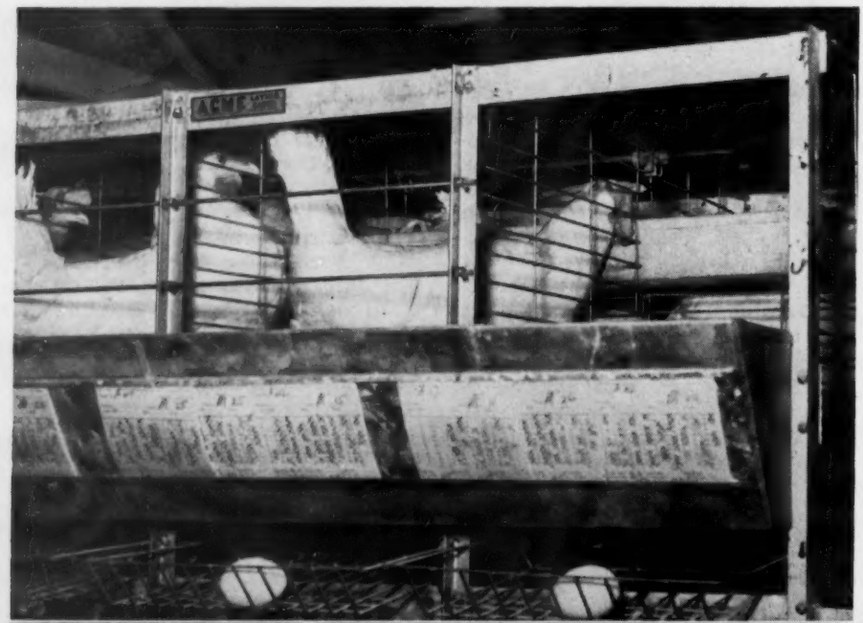
Laying Cages Are Growing Outlet For Galvanized Steel

■ FACTORY methods for egg and meat production are meeting with widespread approval by poultry farms throughout the country. As a consequence, methods for egg-production control, accounting and greater cleanliness have been devised, resulting in the design and building of steel laying cages in batteries accommodating from 24 to 120 birds, with each bird occupying its own compartment.

According to John T. Kilbride, superintendent, Acme Bridgeport Co., Bridgeport, Conn., manufacturer of these new laying cages, meat and eggs produced in this way, because of controlled feeding are more uniform and finer in quality than products of ordinary methods. Egg laying efficiency is increased by tally sheets which show production of eggs for each bird, so that the poor layers may be weeded out and sent to market. Sanitary features which prevent contamination and spread of disease are of equal importance.

This increased acceptance of laying cages is leading to increased use of steel and various types of fabricating equipment for making these units. Approximately 11 pounds of steel are required for the compartment of each bird. Acme laying cages of the battery type built to accommodate 24, 48, 72 or 96 birds are 4 feet wide, 5 feet 10 inches high and from 5 to 17 feet long depending on the capacity. Cages are heavily galvanized steel throughout except for a droppings belt made of rubber resistant to chemical reactions of poultry droppings. Belts are carried on a wire grill track support whose ends are reinforced with steel gusset plates and the steel pipe rollers at the ends of the cages are supported on rounded steel plates. Leg, frame and bracing members are steel angles 1 x 1 x ⅛ and ¾ x ¾ x ⅛ inches. Spotwelded wire partitions separate the compartments and to eliminate downdrafts, the top is covered by a steel sheet. Feed hoppers also are sheet steel. Wire baskets under each cage receive and deliver eggs by gravity feed.

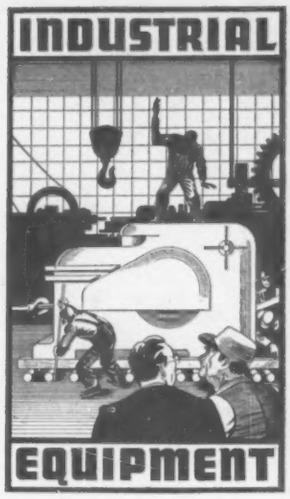
For sanitary purposes all ledges and places where dust and vermin could collect have been designed out of the cages. The drinking-water system of copper tubing and brass nipples supplies water to each bird individually to prevent spread of disease. Water flows by gravity to the nipples which are located on the ceilings of the cages and when the bird pecks at the nipple, water runs down its throat. This method of watering which does away with the raising and lowering of the bird's head is claimed to conserve energy, allowing it to be expended entirely in producing premium quality meat and eggs.



These modern laying cages built entirely of steel are designed for easy individual attention to each bird. Tally sheet in front of each cage, on feed hoppers, permits recording egg production. Droppings belts are of rubber

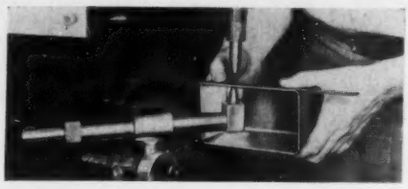
Finish For Oil Heaters

■ A new cabinet finish, "Vitrolain," said to combine the best features of porcelain and crystaline finishes, has been developed by Renown Stove Co., Owosso, Mich., for use on its line of oil heaters. The finish is claimed to be permanent and not to be damaged by high heat or rough treatment. It is burned into the metal at 1600 degrees Fahr.



Welding-Tip Holder

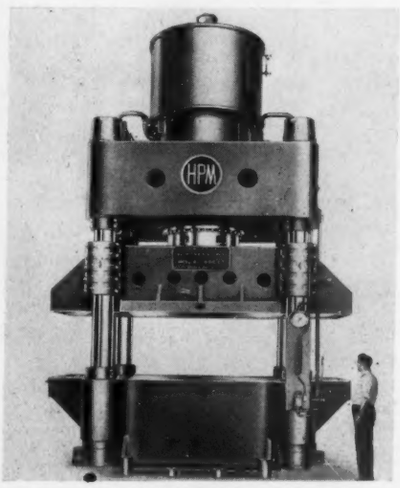
■ The new Universal holder for spot welding tips announced by P. R. Mallory & Co., Inc., 3029 East Washington avenue, Indianapolis, is claimed to be adjustable to all positions required to reach the most inaccessible spots. Holder is assembled entirely of standard parts



and is available with either a 30 or a 90-degree tip socket. Tip knockout device eliminates difficulties encountered in removing replaceable tapered shank tips.

2000-Ton Press

■ The 2000-ton Fastraverse self-contained hydraulic press offered by Hydraulic Press Mfg. Co., Mount Gilead, O., although designed primarily for fabrication of duralumin airplane parts is equally suited for forming or blanking many different parts at one time. The press operates on the Guerin principle which consists fundamentally of using a



block of rubber in the press platen instead of the customary die. Rubber is of a high grade compound having extremely high elongation properties in order not to deteriorate the rubber during the deep drawing and forming operations. Press has a capacity of 2000 tons and pressing surfaces at the sides 92 x 72 inches and at the ends with extensions 60 x 180 inches. The single-press action, that of the main platen, is accomplished by the hydropower closed-circuit operating system, mounted overhead. This system is powered by a 100-horsepower electric motor connected by flexible coupling to an R-200 hydro-power radial pump, and directly connected to this radial pump by seamless steel high-pressure tubing are three cylinders, the main cylinder and two auxiliary pullback cylinders with no operating valves in between. Ram return is accomplished without shock by reversing the pump instead of reversing oil flow by valves. Pump has variable pressure control.

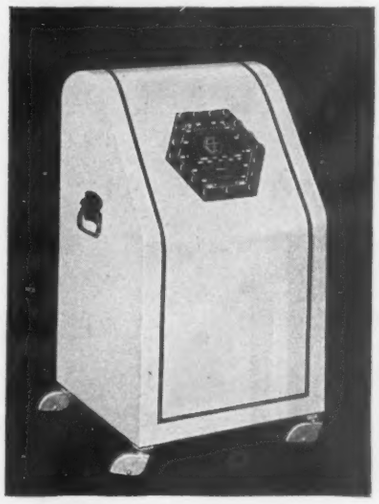
Industrial Compressor

■ Ingersoll-Rand Co. Phillipsburg, N. J., offers a new line of industrial compressors and vacuum pumps in sizes from ¾ through 5 horsepower. These new Type 30 compressors, embodying a simplified "finger valve" construction, form only a

part of the complete range of Type 30 compressors, which are built in sizes from ¾ through 5 horsepower. sures as high as 1000 pounds.

Reactance Arc Welder Has Fast Recovery

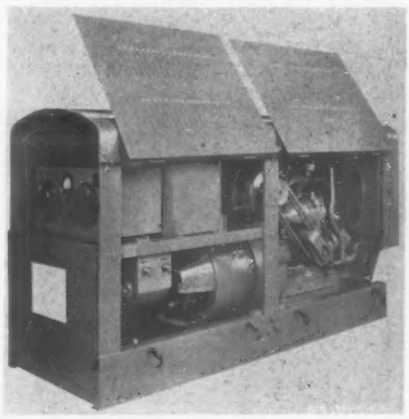
■ Sight Feed Generator Co., Richmond, Ind., has put on the market a reactance alternating-current arc welder with plug-in connections and no moving parts which is claimed to have a power surge of only 8 per cent increase on any current setting. Welder has a fast recovery speed of 1/20 to 1/60-second from ½ to 1 cycle on 60-cycle current, which assures enough voltage to eliminate necessity of re-striking the arc. Stated amperage is maintained in continuous operation, making it unnecessary to reset current as welder warms up. Overall efficiency is 95 per cent. Welders can



be furnished to operate on either 50 or 60-cycle current or both, and are regularly equipped with hooded-type composition casters.

Diesel-Driven Welder

■ A new 300-ampere diesel engine driven arc welder equipped with gasoline-engine starting is announced by Lincoln Electric Co., 12818 Coit road, Cleveland. The gasoline engine is a small auxiliary started by means of a hand crank



and mounted above the diesel engine to which it is connected by a belt drive engaged by a clutch. Starting in extremely cold weather is facilitated because the cooling system of the small gasoline starting engine is connected into the cooling system of the diesel. This makes it possible to warm up the diesel by running the starting engine a short time and allowing the heated water to circulate through the diesel engine.

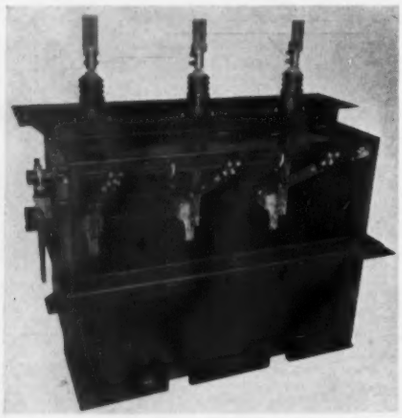
The new welder is said to cut fuel costs 33 to 86 per cent, depending upon the type of fuel oil used. The diesel uses 1.5 gallons of fuel oil per hour at full operation, as compared with 2.75 gallons of gasoline per hour used by conventional gasoline engine welder drive. Total

savings, including such items as transportation of fuel, loss, etc., are claimed to be in many cases, as high as 40 cents per hour.

The arc welding generator used on the new welder is the 300-ampere Shield Arc SAE unit, which features dual continuous control, extra-wide welding range, independent excitation, laminated magnetic circuit, high capacity, high efficiency cool operation and all-purpose meter.

Steel-Enclosed Switch

■ A steel-enclosed group operated switch installed below a type H breaker has been developed by Delta-Star Electric Co., 2400 Block, Fulton street, Chicago. The 7500-volt, 600-ampere, 3-pole switch with full-



floating blades and line pressure contacts is operated by hook type handle with key to lock in open or closed positions. Windows permit inspection of each pole. A screwed type cover completes the enclosure.

Marine Diesel Engine

■ Caterpillar Tractor Co., Peoria, Ill., announces the addition of a four-cylinder, 35-horsepower, model D4400 engine to its line of marine diesels. Rated for 24-hour service, this engine is of medium speed and weight. Bore and stroke are 4¼ x 5½ inches and maximum horsepower is produced at 1500 revolutions per minute.

Standard starting equipment is a two-cylinder, independent, 10-horsepower gasoline engine, which turns the larger engine through a disc clutch and helical gears to the flywheel. Electrical starting is also available.

Noiseless Unit Heater

■ Modine Mfg. Co., Racine, Wis., announces silent operating unit heaters with entire casing interior lines with mastic to deaden noise. Safety fan guard is built-in. Velocity generator (stationary fan) evens air flow through the condenser and eliminates air-rush noise peaks and a Venturi fan shroud reduces air in-

rush noises. The heater motor is mounted in rubber on the fan guard and concentric rings of the guard dissipate vibration.

All sheet metal parts are bonderized for rust protection. V-formed louvres are deeply recessed. It is claimed increased velocities of outlet air and greater room-air turnover are provided without drafts.

Safety Shield

■ Sellstrom Mfg. Co., 615 North Aberdeen street, Chicago, has designed Dependon safety shield allowing ventilation and wearing of prescription glasses or goggles. Window material is synthetic (either clear or tinted) and is claimed to

withstand heat, sparks and acids. Shield is made in various depths from forehead to chin. Headband adjusts to fit any head. "Window" is attached by friction swivel joints enabling wearer to raise it above head without disturbing glasses.

Thermometer and Gage

■ Brown Instrument Co., 4508 Wayne street, Philadelphia, has placed on the market an entirely new and improved line of temperature and pressure recorders, indicators and controllers. These instruments include thermometers of indicating and recording types for temperatures from minus 40 degrees Fahr. to 1200 degrees Fahr., and indicating or recording pressure and vacuum gages for ranges from 6 pounds of water up to 2500 pounds per square inch and on vacuum ranges of 10 inches of mercury and over. Chart is secured to driving mechanism by tapered stud and tapered chart positioning stud, eliminating chart knob and chain. Charts, when renewed, are automatically in time, as the tapered position stud is in effect the hour hand of the electric clock. If current failure makes it necessary to reset chart to correct time line, a friction clutch

permits manual rotation for chart setting. Pen shaft has outboard bearing with hardened pivots mounted on rigid casting unaffected by vibration. Eight-inch pen arm permits pen travel of 4¾ inches and is easily replaced with no effect on calibration. All types are offered in one, two or three pen models.

Hydraulic Lathe

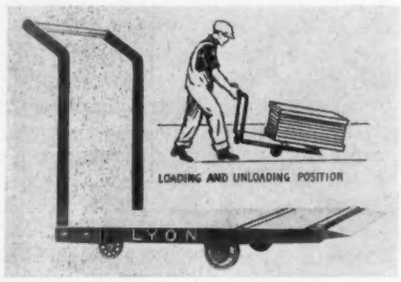
■ A new hydraulic lathe, the Carbo-Matic, with an automatic cycle, is announced by W. C. Lipe, Inc., Syracuse, N. Y. Maximum travel of carriage is 15½ inches forward or reverse on either side of center. Back carriage allows facing or work up to 10 inches in diameter. When a lever is pushed, the spindle starts and tools advance to perform operation. Tool relief follows, and carriage then returns to load position

where entire machine automatically stops, ready again to be loaded. As entire cycle is automatic, no air compressor or air piping are needed.

Base of machine is nickel, high-tensile cast iron. Hour-glass worm gear drive eliminates backlash, and heavy spindle with minimum overhang is mounted on ball or roller bearings. A three point suspension for headstock and bed built in one massive piece insures rigidity of parts and prevents distortion.

Utility Truck

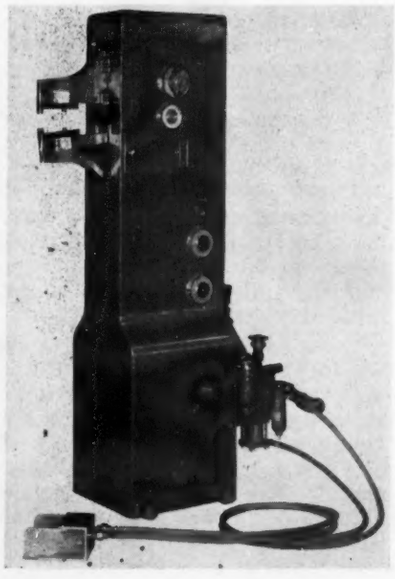
■ Lyon Iron Works, Greene, N. Y., offers a utility truck with 22 x 32½-inch platform 5 inches high and having tilting features which make it easy to load and unload. Rolls on the platform facilitate loading. Handle is 30 inches above floor to enable operator to reach over handle if desired when loading. Truck is regularly furnished with two 4-inch stationary and one 3-inch swivel casters, all wheels with roller bear-



ings and Alemite lubrication. It may be equipped with either semisteel or rubber tired wheels. Weight of truck is 100 pounds.

Pneumatic Riveter Exerts 20 Tons on Dies

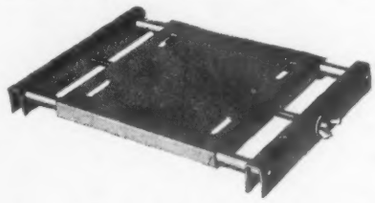
■ Hanna Engineering Works, 1765 Elston avenue, Chicago, has developed a high-speed pneumatic riveter having a complete riveting stroke



(forward and return) of less than one second. When operated at 80 pounds air pressure this riveter exerts 20 tons on the dies, which will drive up to ⅜-inch-diameter rivets cold and ½-inch rivets hot. Die stroke may be anything to a maximum of 3 inches. This riveter will exert its rated pressure (20 tons) uniformly upon the work even though the variation in length of rivet and thickness of grip may vary as much as ⅜-inch. The driving jaws are of the "Alligator" or "Nut Cracker" type made of standard heat treated alloy steel bar stock and shaped to avoid interference with the assemblies being riveted.

Automatic Motor Base

■ The Automatic motor base made by Ideal Commutator Dresser Co., Sycamore, Ill., automatically main-



tains correct belt tension through the action of steel springs which makes it especially suited to short center drives. One such base covers all types of drives—horizontal, vertical or overhead and operates satisfactorily with any type of load—pulsating, steady or reversing. To take up slack in belts from normal wear and stretch, it is only necessary to give the adjusting screw a few turns, which moves base back to give correct belt tension.

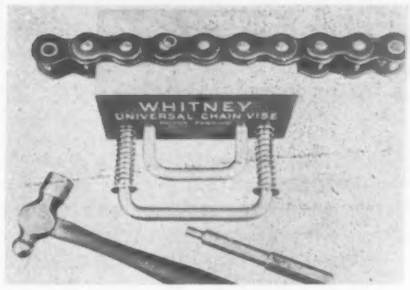
White-Bowl Lamps

■ New white-bowl industrial lamps in sizes ranging from 150 to 1500 watts designed for industrial uses in RLM direct-lighting reflectors for operation in any position are announced by Westinghouse Lamp division, Westinghouse Electric & Mfg. Co., Bloomfield, N. J.

Previously these lamps were designed for base-up burning only, and operation in any other position caused premature blackening. A new formula for the bulb coating eliminates this fault. Coating the bowl reduces the brightness of that part of the lamp, and prevents glare. Lamps with the new coating are identical in appearance with those formerly supplied. Prices of the new coated lamps are the same as those of the previous type.

Universal Chain Vise

■ The Universal chain vise of Whitney Chain & Mfg. Co., Hartford, Conn., enables one man to take apart cottered or riveted type roller chain in pitches from ⅝ to 2½

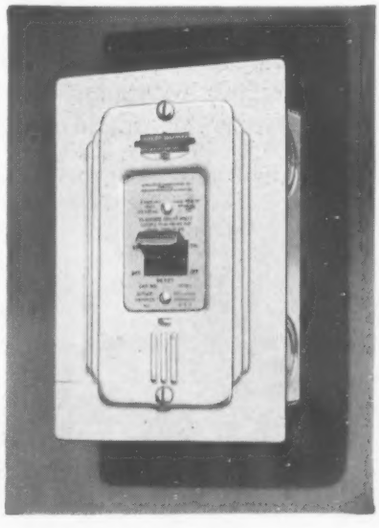


inches inclusive. The vise is opened with one hand and the chain placed into the jaws. Upon releasing, the spring tension clamps the chain accurately into position leaving both hands free for disassembly operation. A few blows of a hammer on the rivet heads forces them through the plate and shears off the head in washer form, eliminating preliminary rivet head grinding.

With this tool it also is possible to repair a chain without removing it from the sprocket since the spring tension will hold the tool in position, and the weight of the vise is sufficient to act as an anvil. Due to vise jaw support at four points on each link, chain tilting is eliminated so that pressure against the rivet head is evenly distributed and distortion of pin and plate is avoided. There are no loose parts to become lost or broken. List price is $5.75, subject to discount.

Small Circuit-Breaker

■ Cutler-Hammer Inc., 315 North Twelfth street, Milwaukee, offers type MO Multi-Breaker rated from 15 to 25 amperes which functions as an entrance or service switch with overload and short circuit protection on lighting circuits, oil burners, stokers, air compressors, air conditioning equipment, etc. Requiring only resetting of a small lever conveniently located to restore service, this breaker can be installed wherever fused type switches are employed. Prices are as low as $2.

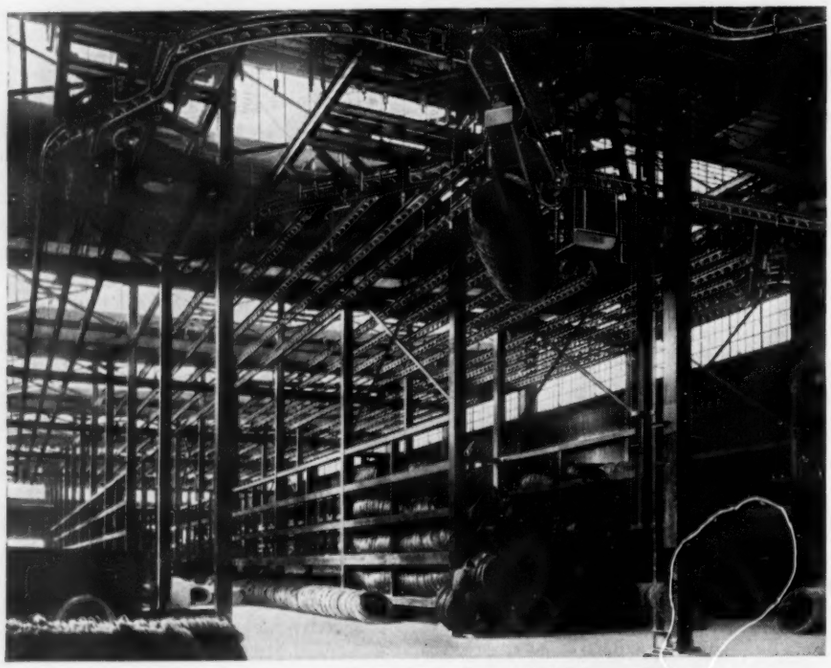


Sheet Packs

(*Concluded from Page* 56)

Sheet packs may be loaded into box cars either with load first or truck first. In Fig. 3, the load is going in first and truck is about in the car, also. Note here the position of the rear wheels and the extremely sharp angle of turn of which this truck is capable. This flexibility in handling the truck permits loads up to 101 inches in length to be loaded into box cars, the standard dimension of which is 106½ inches. To do this, it is essential that the truck be close coupled. As will be noted, the overall dimension of this unit from front of the fork plate to the rear of the battery is only 102 inches. This combination of short wheel base, short overall length and sharp turning angle of steering wheels thus permits exceptionally high maneuverability of the unit.

In Fig. 2, the pack being handled measures 36½ x 97½ inches and weighs 8780 pounds. It is being loaded into the car with trailing wheels first. The pack in Fig. 4 is 38 x 86 inches. Its weight is 8370 pounds. The mast height of 96 inches provides a lift of 58 inches on the forks. The operator can easily stack the sheet packs as shown in Fig. 4 without the aid of an overhead crane, releasing it for other work.



700 lbs. stored per square foot with this Cleveland Tramrail system.

Get maximum

ROD STORAGE

with Cleveland Tramrail

- By making use of the ceiling, Cleveland Tramrail overhead handling systems eliminate need of aisle space and greatly increase rod storage capacity.
- Specially developed hair pin hook carriers pick up and place coils easily, quickly and safely with only one operator.

Also Builders of
CLEVELAND CRANES
All Welded

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
1125 Depot Street Wickliffe, Ohio

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

Sisalin Sections Used To Finish Aluminum

■ In a large Detroit plant processing aluminum, Sisalin sections made by Hanson-Van Winkle-Munning Co., Matawan, N. J., are employed with tripoli composition to completely finish heat-treated aluminum rods, tubing and other aluminum parts. These sections are made of specially-prepared sisal, a tough fibre interleaved with alternate layers of muslin and bound together by various types of sewing.

Previously, these parts had been polished on a cloth wheel using No. 180 Turkish emery with tallow. During this operation the parts became hot and had to be cooled before the buffing and coloring operation which followed.

By using the Sisalin sections only one operation now is necessary instead of three. The handling of parts has been reduced to a minimum and two extra lathes are made available by the elimination of two operations. No polishing wheels have to be set up and no tallow is used. The parts remain cool as very little pressure is required against the buff wheel. Savings on material and labor over the old method are estimated at 50 per cent by the aluminum parts manufacturer.

Cable Saddles

(*Concluded from Page* 60)

fore these were threaded through holes in the side brackets, and coupling sockets cast in place before the saddles were shipped.

Design of these saddles was worked out by close co-operation between the Washington Toll Bridge Authority through Clark H. Eldridge, its bridge engineer, and the engineering and manufacturing departments of Bethlehem Steel Co., Bethlehem, Pa. For structures such as these, there cannot be a design until manufacturing practice and welding sequence is determined; these were mutually adjusted to give an entirely satisfactory product.

These saddles were made in the Welded Products shop of Bethlehem Co. at Bethlehem, Pa. The finished weldments, as shown in Fig. 8, weighed 15 tons each as shipped. The first pair were shipped in three months after the general principles of the design and process were established firmly enough to order the rolled material from the mill.

Producers Attempt To Quicken Output

Pressure For Delivery Heavy, but Peak of Buying Passed

MARKET IN TABLOID ★

Demand
Heavy; railroad, shipbuilding orders outstanding.

Prices
Higher on a few products; scrap continues strong.

Production
Up 4½ points to 84 per cent.

■ THE unprecedented wave of steel buying the past four weeks has passed the crest. Pressure for delivery leaves mills the problem of providing additional iron and steel producing facilities necessary to relieve heavy backlogs.

Ingot output last week rose 4½ points to 84 per cent, extending the September upturn to 20 points. A year ago the rate was 47 per cent. More steelmaking capacity is being added as rapidly as possible. In some cases this is being retarded by shortage of blast furnace capacity. The latter, in turn, is handicapped by lack of adequate coke supplies. Demand for coking coal is taxing mine capacity, with some operators unable to acquire sufficient manpower and equipment to ease the situation immediately.

Scrap prices continue to advance, but the pace is slower and in some districts quotations show signs of leveling off soon. STEEL'S price composite of steelworks scrap grades advanced only 75 cents last week to $20.75, compared with a rise of $4.50 the preceding three weeks. The current figure still is short of the 1937 peak of $22.08 attained in April that year.

Offerings of old material still are small, and the added costs imposed on consumers are reflected in price advances on some finished steel products and in attempts of foundries to use a larger proportion of pig iron in their melt. Some eastern plate producers have advanced prices $5 a ton, but this has not become general. Merchant bars and bands rolled from old rails have been raised $3 a ton, and rail steel reinforcing bars have been increased $2. Cast iron pipe prices are up $3 a ton as a result of higher costs of pig iron and other raw materials.

Requests of buyers for clarification of the early 1940 price outlook may result in announcement soon of first quarter quotations. Meanwhile mills are accepting business in most products for delivery after Dec. 31 only at prices ruling at time of shipment.

Many producers report being sold out for the new quarter, capacity being most heavily engaged in bars, sheets, strip and tin plate. Export business is aiding tin plate operations which last week moved up 3 points to 83 per cent. Semifinished steel bookings, in addition to producers' own requirements, will tax output the next 90 days, although little export tonnage has been taken lately.

What portion of September's steel business is destined for buyers' stocks, rather than for consumption this quarter, is difficult to determine. Actual and prospective price increases have been an important factor in stimulating forward coverage, with relatively low inventories also an influence.

At the same time, consumption is expanding steadily in many directions. Automobile production, quickened by better retail sales than was expected, rose nearly 9000 units last week to 62,755 cars and trucks, highest in 13 weeks. Railroad demand for equipment and track material has shown the most abrupt increase in many years, and activity in structural shapes has expanded markedly the past week or two.

Latest freight car orders involve an additional 14,000 units. Protection has been obtained on approximately 500,000 tons of steel for new cars alone, including about 5000 cars for export. An additional 100,000 tons is under protection for equipment repairs. This includes cars placed recently as well as those pending. Rail purchases last week totaled close to 130,000 tons, with a large tonnage still pending.

September pig iron shipments in several districts more than doubled the August movement. Record-breaking deliveries are in prospect for fourth quarter. Steel ingot production probably will be the largest in history for the final period, if not in excess of the all-time quarterly peak reached the second quarter of 1929.

Export business in finished steel represents only a small portion of total bookings received the past four weeks, but inquiries continue heavy.

Ferrotungsten, tungsten metal powder and tungsten ore prices have advanced further. Manganese ore quotations are strong in view of the German-Russian trade pact. Imported iron ore prices continue nominal.

Steelmaking gains were smaller in most districts last week, as a number of plants already are at capacity. Pittsburgh was up 4 points to 79, Chicago rose 5½ points to 84 and Youngstown moved up 4 points to 86. Other increases included 2 points to 61 in eastern Pennsylvania; 3½ points to 87½ at Cleveland; 3 points to 86 at Birmingham; 20 points to 100 in New England; 7 points to 78½ at Cincinnati and 5½ points to 72 at St. Louis. Unchanged were Wheeling at 88, Buffalo at 72 and Detroit at 99.

COMPOSITE MARKET AVERAGES

	Sept. 30	Sept. 23	Sept. 16	One Month Ago Aug., 1939	Three Months Ago June, 1939	One Year Ago Sept., 1938	Five Years Ago Sept., 1934
Iron and Steel	$37.16	$37.16	$36.76	$35.95	$35.69	$36.48	$32.15
Finished Steel	55.60	55.60	55.60	55.60	55.70	57.20	54.00
Steelworks Scrap..	20.75	20.00	17.83	15.30	14.49	14.23	9.45

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Sept. 30, 1939	Aug. 1939	June 1939	Sept. 1938
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.25c
Steel bars, Chicago	2.15	2.15	2.15	2.25
Steel bars, Philadelphia	2.47	2.47	2.47	2.57
Iron bars, Terre Haute, Ind.	2.05	2.05	2.05	2.15
Shapes, Pittsburgh	2.10	2.10	2.10	2.10
Shapes, Philadelphia	2.215	2.215	2.215	2.215
Shapes, Chicago	2.10	2.10	2.10	2.10
Plates, Pittsburgh	2.10	2.10	2.10	2.10
Plates, Philadelphia	2.15	2.15	2.15	2.15
Plates, Chicago	2.10	2.10	2.10	2.10
Sheets, hot-rolled, Pittsburgh	2.00	2.00	2.00	2.15
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.20
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.50
Sheets, hot-rolled, Gary	2.00	2.00	2.00	2.15
Sheets, cold-rolled, Gary	3.05	3.05	3.05	3.20
Sheets, No. 24 galv., Gary	3.50	3.50	3.50	3.50
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.60
Tin plate, per base box, Pitts.	$5.00	$5.00	$5.00	$5.35
Wire nails, Pittsburgh	2.45	2.40	2.45	2.45

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$34.00	$34.00	$34.00	$34.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	34.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	34.00
Wire rods, No. 5 to 9/32-inch, Pitts.	43.00	43.00	43.00	43.00

Pig Iron

	Sept. 30, 1939	Aug. 1939	June 1939	Sept. 1938
Bessemer, del. Pittsburgh	$24.34	$22.34	$22.34	$21.34
Basic, Valley	22.50	20.50	20.50	19.50
Basic, eastern, del. Philadelphia	24.34	22.34	22.34	21.34
No. 2 foundry, Pittsburgh	24.21	22.21	22.21	21.21
No. 2, foundry, Chicago	23.00	21.00	21.00	20.00
Southern No. 2, Birmingham	19.38	17.38	17.38	16.38
Southern No 2, del. Cincinnati	22.89	20.89	20.89	19.89
No. 2X, del. Phila. (differ. av.)	25.215	23.215	23.215	22.215
Malleable, Valley	23.00	21.00	21.00	20.00
Malleable, Chicago	23.00	21.00	21.00	20.00
Lake Sup., charcoal, del. Chicago	30.34	28.34	28.34	28.34
Gray forge, del. Pittsburgh	23.17	21.17	21.17	20.17
Ferromanganese, del. Pittsburgh	105.33	85.33	85.33	97.77

Scrap

Heavy melting steel, Pittsburgh	$22.75	$16.15	$15.00	$15.25
Heavy melt. steel, No. 2, E. Pa.	20.25	14.375	13.125	12.75
Heavy melting steel, Chicago	20.25	13.75	13.55	13.60
Rails for rolling, Chicago	22.25	17.75	17.75	17.75
Railroad steel specialties, Chicago	21.75	15.50	15.50	16.60

Coke

Connellsville, furnace, ovens	$3.75	$3.75	$3.75	$3.75
Connellsville, foundry, ovens	5.00	5.00	5.00	5.00
Chicago, by-product fdry., del.	10.50	10.50	10.50	10.50

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Hot Rolled

Pittsburgh	2.00c
Chicago, Gary	2.00c
Cleveland	2.00c
Detroit, del.	2.10c
Buffalo	2.00c
Sparrows Point, Md.	2.00c
New York, del.	2.24c
Philadelphia, del.	2.17c
Granite City, Ill.	2.10c
Middletown, O.	2.00c
Youngstown, O.	2.00c
Birmingham	2.00c
Pacific Coast points	2.50c

Cold Rolled

Pittsburgh	3.05c
Chicago, Gary	3.05c
Buffalo	3.05c
Cleveland	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.37c
New York, del.	3.39c
Granite City, Ill.	3.15c
Middletown, O.	3.05c
Youngstown, O.	3.05c
Pacific Coast points	3.65c

Galvanized No. 24

Pittsburgh	3.50c
Chicago, Gary	3.50c
Buffalo	3.50c
Sparrows Point, Md.	3.50c
Philadelphia, del.	3.67c
New York, delivered	3.74c
Birmingham	3.50c
Granite City, Ill.	3.60c
Middletown, O.	3.50c
Youngstown, O.	3.50c
Pacific Coast points	4.00c

Black Plate, No. 29 and Lighter

Pittsburgh	3.05c
Chicago, Gary	3.05c
Granite City, Ill.	3.15c

Long Ternes No. 24 Unassorted

Pittsburgh, Gary	3.80c
Pacific Coast	4.50c

Enameling Sheets

	No. 10	No. 20
Pittsburgh	2.75c	3.35c
Chicago, Gary	2.75c	3.35c
Granite City, Ill.	2.85c	3.45c
Youngstown, O.	2.75c	3.35c
Cleveland	2.75c	3.35c
Middletown, O.	2.75c	3.35c
Pacific Coast	3.35c	3.95c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	24.00	35.00
Cold stp.	22.00	22.50	32.00	52.00

Steel Plate

Pittsburgh	2.10c
New York, del.	2.29c
Philadelphia, del.	2.15c
Boston, delivered	2.42c
Buffalo, delivered	2.33c
Chicago or Gary	2.10c
Cleveland	2.10c
Birmingham	2.10c
Coatesville, Pa.	2.35c
Sparrows Point, Md.	2.10c
Claymont, Del.	2.10c
Youngstown	2.10c
Gulf ports	2.45c
Pacific Coast points	2.60c

Steel Floor Plates

Pittsburgh	3.35c
Chicago	3.35c
Gulf ports	3.70c
Pacific Coast ports	3.95c

Standard Shapes

Pittsburgh	2.10c
Philadelphia, del.	2.21½c
New York, del.	2.27c
Boston, delivered	2.41c
Bethlehem	2.10c
Chicago	2.10c
Cleveland, del.	2.30c
Buffalo	2.10c
Gulf ports	2.45c
Birmingham	2.10c
St. Louis, del.	2.34c
Pacific Coast points	2.70c

Tin and Terne Plate

Tin Plate, Coke (base box)

Pittsburgh, Gary, Chicago	$5.00
Granite City, Ill.	5.10

Mfg. Terne Plate (base box)

Pittsburgh, Gary, Chicago	$4.30
Granite City, Ill.	4.40

Bars

Soft Steel

(*Base, 20 tons or over*)

Pittsburgh	2.15c
Chicago or Gary	2.15c
Duluth	2.25c
Birmingham	2.15c
Cleveland	2.15c
Buffalo	2.15c
Detroit, delivered	2.25c
Philadelphia, del.	2.47c
Boston, delivered	2.52c
New York, del.	2.49c
Gulf ports	2.50c
Pacific Coast points	2.75c

Rail Steel

(*Base, 5 tons or over*)

Pittsburgh	2.15c
Chicago or Gary	2.15c
Detroit, delivered	2.25c
Cleveland	2.15c

Buffalo	2.15c
Birmingham	2.15c
Gulf ports	2.50c
Pacific Coast points	2.75c

Iron

Chicago, Terre Haute	2.05c
Philadelphia	2.37c
Pittsburgh, refined	3.50-8.00c

Reinforcing

*New Billet Bars, Base**

Chicago, Gary, Buffalo, Cleve., Birm., Young., Sparrows Pt., Pitts.	1.90c
Gulf ports	2.25c
Pacific Coast ports	2.35c

*Rail Steel Bars, Base**

Pittsburgh, Gary Chicago, Buffalo, Cleveland, Birm.	1.90c
Gulf ports	2.25c
Pacific Coast ports	2.35c

**Base prices 20 cents less per 100 lbs. in lots of 20 tons or over of one size, in lengths of 30 feet or over, for shipment at one time to one destination.*

Wire Products

Pitts-Cleve.-Chicago-Birm. base per 100 lbs keg in carloads

Standard wire nails	$2.40
Cement coated nails	$2.40
(Per pound)	
Polished fence staples	2.40c
Galv. barbed wire, standard 12½ gage two-point hog, 80-rod spool $2.76; two-point cattle, 80-rod spool	$2.58
Annealed fence wire	2.90c
Galv. fence wire	3.30c
Woven wire fencing (base C. L. column)	57.00
Single loop bale tie (base C. L. column)	56.00

To Manufacturing Trade

Base, Pitts. - Cleve. - Chicago-Birmingham (except spring wire)

Bright bess., basic wire	2.60c
Galvanized wire	2.65c
Spring wire	3.20c

Worcester, Mass., $2 higher on bright basic and spring wire.

Cut Nails

Carload, Pittsburgh $3.70

Cold-Finished Bars

	Carbon	Alloy
Pittsburgh	2.65c	3.35c
Chicago	2.65c	3.35c
Gary, Ind.	2.65c	3.35c
Detroit	2.70c	*3.45c
Cleveland	2.65c	3.35c
Buffalo	2.65c	3.35c

* Delivered.

Alloy Bars (Hot)

(Base, 20 tons or over)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	2.70c
Detroit, delivered	2.80c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo. 0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni. 1.10
5100 0.80-1.10 Cr. 0.45
5100 Cr. spring flats 0.15
6100 bars 1.20
6100 spring flats 0.85
Cr. N., Van. 1.50
Carbon Van. 0.85
9200 spring flats 0.15
9200 spring rounds, squares 0.40
Electric furnace up 50 cents.

Strip and Hoops

(Base, hot strip, 1 ton or over; cold, 3 tons or over)

Hot Strip, 12-inch and less

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, Birmingham	2.00c
Detroit, del.	2.10c
Philadelphia, del.	2.32c
New York, del.	2.36c
Cooperage hoop, Youngs., Pitts.; Chicago, Birm.	2.10c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown	2.80c
Chicago	2.90c
Detroit, del.	2.90c
Worcester, Mass.	3.00c

Carbon	Cleve., Pitts.
0.26—0.50	2.80c
0.51—0.75	4.30c
0.76—1.00	6.15c
Over 1.00	8.35c

Worcester, Mass. $4 higher.

Commodity Cold-Rolled Strip

Pitts.-Cleve.-Youngstown	2.95c
Detroit, del.	3.05c
Worcester, Mass.	3.95c

Lamp stock up 10 cents.

Rails, Fastenings

(Gross Tons)

Standard rails, mill	$40.00
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pitts., Chicago, B'ham.	$40.00
Do., rerolling quality	39.00

Cents per pound

Angle bars, billet, mills	2.70c
Do., axle steel	2.35c
Spikes, R. R. base	3.00c
Track bolts, base	4.15c
Car axles forged, Pitts., Chicago, Birmingham.	3.15c
Tie plates, base	2.15c

Base, light rails 25 to 60 lbs., 20 lbs., up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists, carloads 5% up; full containers additional 10%.

Carriage and Machine

½ x 6 and smaller	68.5 off
Do. larger, to 1-in.	66 off
Do. 1⅛ and larger	64 off
Tire bolts	52.5 off

Stove Bolts

In packages with nuts attached 72.5 off; in packages with nuts separate 72.5-12½ off; bulk 84 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Step bolts	60 off
Elevator bolts	60 off
Plow bolts	68.5 off

Nuts

Semifinished hex.	U.S.S.	S.A.E.
6-inch and less	67	70
⅞-1-inch	64	65
1⅛ and larger	62	62

Hexagon Cap Screws

Upset, 1-in., smaller ..... 67.5 off

Square Head Set Screws

Upset, 1-in., smaller	75.0 off
Headless set screws	70.0 off

Piling

Pitts., Chgo., Buffalo	2.40c
Gulf ports	2.75c

Rivets, Washers

Structural, Pittsburgh, Cleveland, Chicago	3.40c
⅞-inch and smaller, 11 and 12	63½ 54
Pitts., Chi., Cleve.	65-10 off
Wrought washers, Pitts., Chi., Phila., to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75 off	

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2½ and 1½ less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld

Steel

In.	Blk.	Galv.
½	63½	54
¾	66½	58
1—3	68½	60½

Iron

¾	30	13
1—1¼	34	19
1½	38	21½
2	37½	21

Lap Weld

Steel

2	61	52½
2½—3	64	55½
3½—6	66	57½
7 and 8	65	55½
9 and 10	64½	55

Iron

2	30½	15
2½—3½	31½	17½
4	33½	21
4½—8	32½	20
9—12	28½	15

Line Pipe

Steel

1 to 3, butt weld	67½
2, lap weld	60
2½ to 3, lap weld	63
3½ to 6, lap weld	65
7 and 8, lap weld	64
10-inch lap weld	63½
12-inch, lap weld	62½

Iron

	Blk.	Galv.
¾ butt weld	25	7
1 and 1¾ butt weld	29	13
1½ butt weld	33	15½
2 butt weld	32½	15
1½ lap weld	23½	7
2 lap weld	25½	9
2½ to 3½ lap weld	26½	11½
4 lap weld	28½	15
4½ to 8 lap weld	27½	14
9 to 12 lap weld	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet; f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded

Sizes	Gage	Steel	Charcoal Iron
1½"O.D.	13	$ 9.72	$23.71
1¾"O.D.	13	11.06	22.93
2" O.D.	13	12.38	19.35
2¼"O.D.	13	13.79	21.68
2¼"O.D.	12	15.16	.....
2½"O.D.	12	16.58	26.57
2¾"O.D.	12	17.54	29.00
3" O.D.	12	18.35	31.36
3½"O.D.	11	23.15	39.81
4" O.D.	10	28.66	49.90
5" O.D.	9	44.25	73.93
6" O.D.	7	68.14	.....

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1 "O.D.	13	$ 7.82	$ 9.01
1¼"O.D.	13	9.26	10.67
1½"O.D.	13	10.23	11.79
1¾"O.D.	13	11.64	13.42
2" O.D.	13	13.04	15.03
2¼"O.D.	13	14.54	16.76
2¼"O.D.	12	16.01	18.45
2½"O.D.	12	17.54	20.21
2¾"O.D.	12	18.59	21.42
3" O.D.	12	19.50	22.48
3½"O.D.	11	24.62	28.37
4" O.D.	10	30.54	35.20
4½"O.D.	10	37.35	43.04
5" O.D.	9	46.87	54.01
6" O.D.	7	71.96	82.93

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm.	$45.00-46.00
4-in., Birmingham	48.00-49.00
4-in., Chicago	56.80-57.80
6-in. & over, Chicago	53.80-54.80
6-in. & over, east fdy.	49.00
Do., 4-in.	52.00

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Rerolling Billets, Slabs

(Gross Tons)

Pittsburgh, Chicago, Gary, Cleve., Buffalo, Young., Birm., Sparrows Point	$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00

Forging Quality Billets

Pitts., Chi., Gary, Cleve., Young., Buffalo, Birm.	40.00
Duluth	42.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago	34.00
Detroit, delivered	36.00

Wire Rods

Pitts., Cleveland, Chicago, Birmingham No. 5 to ⅜-inch incl.	43.00
Do., over ⅜ to 41/64-in.incl.	48.00

Worcester up $2; Galveston up $6; Pacific Coast up $9.

Skelp

Pitts., Chi., Youngstown, Coatesville, Sparrows Pt.	1.90c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.75
Connellsville, fdry.	4.75- 5.50
Connell. prem. fdry.	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.50- 5.75
Wise county fur.	4.50- 4.75

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	9.75
Chicago, del.	10.50
Terre Haute, del.	10.00
Milwaukee, ovens	10.50
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.00
Indianapolis, del.	10.00
Cincinnati, del.	9.75
Cleveland, del.	10.30
Buffalo, del.	10.50
Detroit, del.	10.25
Philadelphia, del.	10.65

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol	16.00c
Toluol, two degree	22.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
Do. (450 lbs)	15.25c

Eastern Plants, per lb.

Naphthalene flakes, balls, bbls. to jobbers	5.75c

Per ton, bulk, f.o.b. port

Sulphate of ammonia	$28.00

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$24.00	$24.50	$23.50	$25.00
Birdsboro, Pa.	24.00	24.50	23.50	25.00
Birmingham, Ala.‡	19.38	..	18.38	24.00
Buffalo	23.00	23.50	22.00	24.00
Chicago	23.00	23.00	22.50	23.50
Cleveland	23.00	23.00	22.50	23.50
Detroit	23.00	23.00	22.50	23.50
Duluth	23.50	23.50	....	24.00
Erie, Pa.	23.00	23.50	22.50	24.00
Everett, Mass.	24.00	24.50	23.50	25.00
Granite City, Ill.	23.00	23.00	22.50	23.50
Hamilton, O.	23.00	23.00	22.50	..
Neville Island, Pa.	23.00	23.00	22.50	23.50
Provo, Utah	21.00	..	.....	.....
Sharpsville, Pa.	23.00	23.00	22.50	23.50
Sparrow's Point, Md.	24.00	..	23.50	..
Swedeland, Pa.	24.00	24.50	23.50	25.00
Toledo, O.	23.00	23.00	22.50	23.50
Youngstown, O.	23.00	23.00	22.50	23.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	24.39	24.39	23.89	24.89
Baltimore from Birmingham	24.78	.....	23.66	.....
Boston from Birmingham	24.12	.....	.....	.....
Boston from Everett, Mass.	24.50	25.00	24.00	25.50
Boston from Buffalo	24.50	25.00	24.00	25.50
Brooklyn, N. Y., from Bethlehem	26.50	27.00	..	..
Canton, O., from Cleveland	24.39	24.39	23.89	24.89
Chicago from Birmingham	†23.22	.....	.....	.....
Cincinnati from Hamilton, O.	23.24	24.11	23.61	.....
Cincinnati from Birmingham	23.06	....	22.06	....
Cleveland from Birmingham	23.32	..	22.82	..
Mansfield, O., from Toledo, O.	24.94	24.94	24.44	24.44
Milwaukee from Chicago	24.10	24.10	23.60	24.60
Muskegon, Mich., from Chicago, Toledo or Detroit	26.19	26.19	25.69	26.69
Newark, N. J., from Birmingham	25.15	....	.....	.....
Newark, N. J., from Bethlehem	25.53	26.03	..	..
Philadelphia from Birmingham	24.46	..	23.96	....
Philadelphia from Swedeland, Pa.	24.84	25.34	24.34	....
Pittsburgh district from Neville Island	(Neville base, plus 69c, 84c, and $1.24 freight.			
Saginaw, Mich., from Detroit	25.45	25.45	24.95	24.95

	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	23.50	23.50	23.00	....
St. Louis from Birmingham	†23.12	....	22.62	....
St. Paul from Duluth	25.63	25.63	....	26.13

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Buffalo, N. Y., $28.50, base; $29.74 delivered Philadelphia.

Gray Forge		Charcoal	
Valley furnace	$22.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	22.50	do., del. Chicago	30.34
		Lyles, Tenn.	26.50

‡Silvery

Jackson county, O., base: 6-6.50 per cent $27.50; 6.51-7—$28.00; 7-7.50—$28.50; 7.51-8—$29.00; 8-8.50—$29.50; 8.51-9—$30.00; 9-9.50—$30.50; Buffalo, $1.25 higher.

Bessemer Ferrosilicon‡

Jackson county, O., base; Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$60.80

First Quality

Pa., Ill., Md., Mo., Ky.	47.50
Alabama, Georgia	47.50
New Jersey	52.50

Second Quality

Pa., Ill., Ky., Md., Mo.	42.75
Georgia, Alabama	34.20
New Jersey	49.00

Ohio

First quality	39.90
Intermediate	36.10
Second quality	31.35

Malleable Bung Brick

All bases	$56.05

Silica Brick

Pennsylvania	$47.50
Joliet, E. Chicago	55.10
Birmingham, Ala.	47.50

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$28.00
Wire cut	$26.00

Magnesite

Imported dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Do. domestic	40.00
Do., f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00
Quickset magnesite grains, f.o.b. Chewelah, Wash., net, bulk	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$47.00
Chem. bonded chrome	47.00
Magnesite brick	67.00
Chem. bonded magnesite	57.00

Fluorspar

Washed gravel, duty pd., tide, net ton	$25.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	20.00
Do. barge	20.00
No. 2 lump	21.00-22.00

Ferroalloy Prices

Ferromanganese, 78-82%, tidewater, duty pd. $100.00
Do., del. Pittsburgh 105.33

Spiegeleisen, 19-21% dom. Palmerton, Pa., spot 32.00
Do., 26-28%, Palmerton 39.50

Ferrosilicon, 50% freight allowed, c.l. 69.50
Do., ton lot 80.50
Do., 75 per cent 126.00
Spot, $5 a ton higher.

Silicomanganese, 2½ c. 103.00
2% carbon, 108.00; 1%, 118.00
Contract ton price $11 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 2.25

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80-2.90

Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electrolytic, per ton, c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del. carlots 10.50c
Do., ton lots 11.25c
Do., less-ton lots 11.50c
67-72% carloads, 2% carbon, per lb. contained chrome 16.50c
Do., ton lots 17.25c
Do., less-ton lots 17.75c

	Carloads	Ton lots	Less ton
2% carb.	16.50c	17.25c	17.75c
1% carb.	17.50c	18.25c	18.75c
0.10% carb.	19.50c	20.25c	20.75c
0.20% carb.	18.50c	19.25c	19.75c

Spot ¼c higher

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Ferrotitanium, 40-45%, lb., con. ti., f.o.b. Niagara Falls, ton lots $1.23
Do., less-ton lots 1.25
20-25% carbon, 0.10 max., ton lots, lb. 1.35
Do. less-ton lots 1.40
Spot 5c higher

Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls $2.25
Do., less-ton lots 2.30
Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton $142.50
Do, spot 145.00
Do, contract, ton lots 145.00
Do, spot, ton lots 150.00
15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50
Do, spot 160.00
Do, contract, ton lots 160.00
Do, spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c
Spot ½c lb. higher

Chromium Briquets, contract, any quantity, freight allowed, lb. 7.25c
Do, spot carlots, bulk 7.50c
Do, ton lots 8.00c
Do., less-ton lots 8.25c

Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. $2.75
Do, smaller lots 2.85

Vanadium Pentoxide, contract, lb. contained $1.10
Do, spot 1.15

Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome 80.00c
Do, spot 85.00c
88% chrome, contract 79.00c
Do, spot 84.00c

Silicon Metal, 1% iron, contract, carlots, 2 x ⅛-in., lb. 14.00c
Do., 2% 12.50c
Spot ¼c higher

Silicon Briquets, contract carloads freight allowed, ton $69.50
Carload, spot 74.50
Less-ton lots, lb. 3.75c

Manganese Briquets, contract carloads, bulk freight allowed, lb. 5.00c
Ton lots 5.50c
Less-ton lots 5.75c
Spot ¼c higher

Zirconium Alloy, 12-15%, contract, carloads, gross ton $97.50
Do, spot 102.50

34-40%, contract, carloads, lb., alloy 14.00c
Do, ton lots 15.00c
Do, less-ton lots 16.00c
Spot ¼c higher

Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb. $2.60
Do, 100-200 lb. lots 2.75
Do, under 100-lb. lots 3.00

Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant 80.00c

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets: Hot Rolled	Sheets: Cold Rolled	Sheets: Galv. No. 24	Cold Rolled Strip	Cold Drawn Bars: Carbon	Cold Drawn Bars: SAE 2300	Cold Drawn Bars: SAE 3100
Boston	3.88	4.06	5.06	3.85	3.85	5.66	3.71	4.78	4.86	3.46	4.13	8.63	7.23
New York (Met.)	3.84	3.96	3.96	3.76	3.75	5.56	3.43	4.60	4.74	3.51	4.09	8.59	7.19
Philadelphia	3.85	3.85	4.35	3.55	3.55	5.25	3.50	4.55	4.43	3.51	4.06	8.56	7.16
Baltimore	3.70	3.85	3.80	3.55	3.55	5.00	3.55	4.90	5.05	....	4.05	....	....
Norfolk, Va.	3.90	4.00	....	3.75	3.75	5.20	3.75	....	5.40	....	4.15	....	....
Buffalo	3.35	3.82	3.82	3.62	3.40	5.25	3.35	4.40	4.50	3.42	3.75	8.15	6.75
Pittsburgh	3.35	3.60	3.60	3.40	3.40	5.00	3.35	....	4.50	3.35	3.65	8.35	6.95
Cleveland	3.25	3.50	3.50	3.40	3.58	5.18	3.35	4.55	4.62	3.20	3.75	8.15	6.75
Detroit	3.33	3.43	3.68	3.60	3.65	5.27	3.43	4.50	4.59	3.40	3.80	8.45	7.05
Cincinnati	3.60	3.67	3.67	3.65	3.68	5.28	3.42	....	4.57	3.45	4.00	8.50	7.10
Chicago	3.50	3.60	3.60	3.55	3.55	5.15	3.35	4.30	4.60	3.50	3.75	8.15	6.75
Twin Cities	3.75	3.85	3.85	3.80	3.80	5.40	3.60	4.95	4.50	3.83	4.34	8.84	7.44
Milwaukee	3.63	3.73	3.73	3.68	3.68	5.28	3.48	4.43	4.73	....	3.88	8.38	6.98
St. Louis	3.62	3.72	3.72	3.47	3.47	5.07	3.38	4.32	4.52	3.61	4.02	8.52	7.12
Kansas City	4.05	4.15	4.15	4.00	4.00	5.60	3.90	....	5.00	....	4.30	....	....
Memphis	3.90	4.00	4.00	3.95	3.95	5.71	3.75	....	5.00	....	4.31	....	....
Chattanooga	3.80	3.90	3.90	3.85	3.85	5.80	3.65	....	4.40	....	4.39	....	....
Tulsa, Okla.	4.44	4.54	4.54	4.33	4.33	5.93	4.24	....	5.19	....	4.69	....	....
Birmingham	3.50	3.60	3.60	3.35	3.55	5.88	3.35	....	4.85	..	4.43	....	....
New Orleans	3.85	4.65	4.65	3.80	3.80	5.75	4.10	....	4.60	5.00	5.10	....	....
Houston, Tex.	4.05	6.20	6.20	4.05	4.05	5.75	4.20	....	5.25	....	....	....	....
Seattle	3.65	3.85	5.20	3.40	3.50	5.25	3.70	6.50	4.75	....	5.60	....	....
Portland, Oreg.	4.00	4.40	6.10	4.00	4.00	5.50	3.95	6.50	4.75	..	5.85	....	....
Los Angeles	4.00	4.50	6.35	4.00	4.00	6.20	4.20	6.30	5.00	4.45	6.00	10.40	9.55
San Francisco	4.00	4.35	6.00	4.00	4.00	5.60	3.75	6.40	5.15	....	6.55	10.65	9.80

	SAE Hot-rolled Bars (Unannealed): 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.18	7.50	6.05	5.80	7.90
New York (Met.)	4.04	7.35	5.90	5.65	....
Philadelphia	3.85	7.31	5.86	5.61	7.71
Baltimore	3.85	....	....	....	....
Norfolk, Va.	....	....	....	....	....
Buffalo	3.55	7.10	5.65	5.40	7.50
Pittsburgh	3.40	7.35	5.95	5.50	7.60
Cleveland	3.30	7.30	5.85	5.85	7.70
Detroit	3.38	7.42	5.97	5.72	7.19
Cincinnati	3.65	7.44	5.99	5.74	7.84
Chicago	3.70	7.10	5.65	5.40	7.50
Twin Cities	3.95	7.45	6.00	6.09	8.19
Milwaukee	3.78	7.33	5.88	5.63	7.73
St. Louis	3.82	7.47	6.02	5.77	7.87
Seattle	5.65	....	7.80	7.65	8.45
Portland, Oreg.	5.70	....	7.80	7.65	8.50
Los Angeles	4.65	9.40	8.55	8.40	9.05
San Francisco	5.00	9.65	8.80	8.65	9.30

BASE QUANTITIES

Soft Bars, Bands, Hoops, Plates, Shapes, Floor Plates, Hot Rolled Sheets and SAE 1035-1050 Bars: Base, 400-1999 pounds, except 0-1999 pounds (hot rolled sheets only) in New York; 300-1999 pounds in Los Angeles; 0-299 pounds (hoops only) in San Francisco; 300-4999 pounds in Portland, Seattle; 400-14,999 pounds in Twin Cities; 400-3999 pounds in Birmingham.

Cold Rolled Sheets: Base, 400-1499 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York and St. Louis; 450-3749 pounds in Boston; 500-1499 pounds in Buffalo; 1000-1999 pounds in Philadelphia; 300-4999 pounds in San Francisco and Portland; any quantity in Twin Cities.

Galvanized Sheets: Base, 0-1499 pounds in New York, Tulsa; 150-1499 pounds in Cleveland, Chicago, Milwapkee, Pittsburgh; 1-9 bundles in Baltimore, Norfolk; 1-6 bundles in Los Angeles; 300-4999 pounds in Portland, San Francisco; 450-3749 pounds in Boston; 500-1499 pounds in Birmingham, Buffalo, Cincinnati, Detroit, St. Louis; 1500 pounds and over in Chattanooga, Philadelphia; any quantity in Twin Cities.

Cold Rolled Strip: No base quantity; extras apply on lots of all size.

Cold Finished Bars: Base, 1000 pounds and over, except 0-299 pounds in San Francisco.

SAE Hot Rolled Alloy Bars: Base, 1000 pounds and over, except 0-4999 pounds in San Francisco; 0-1999 in Portland.

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, Sept. 28

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports	£ s d	Quoted in dollars at current value	Continental Channe or North Sea ports, gross tons **Quoted in gold pounds sterling	£ s d
Foundry, 2.50-3.00 Si.	$20.00	5 0 0	$18.32		2 3
Basic bessemer	....	....	19.59		2 6 0
Hematite, Phos. .03-.05	21.00	5 5 0*	....		....
Billets	$29.50	7 7 6	$38.34		4 10 0
Wire rods, No. 5 gage	45.50	11 7 6	43.67		5 2 6
Standard rails	$38.00	9 10 0	$48.99		5 15 0
Merchant bars	1.94c	11 0 0	1.81c to 1.90c	4 15 0 to 5 0 0	
Structural shapes	1.77c	10 0 0	1.76c to 1.81c	4 12 6 to 4 15 0	
Plates, †¼ in. or 5 mm.	1.93c	10 18 9	2.14c to 2.33c	5 12 6 to 6 2 6	
Sheets, black, 24 gage or 0.5 mm.	2.30c	13 0 0	2.90c	7 12 6°	
Sheets, gal., 24 ga., corr.	2.78c	15 15 0	3.47c	9 2 6	
Bands and strips	2.16c	12 5 0	1.90c to 1.92c	5 0 0 to 5 1 0	
Plain wire, base	3.45c	19 10 0	2.33c to 2.66c	6 2 6 to 7 0 0	
Galvanized wire, base	4.00c	23 5 0	2.99c	7 17 6	
Wire nails, base	....	....	2.66c to 2.76c	7 0 0 to 7 5 0	
Tin plate, box 108 lbs.	$4.05	1 0 3	....	....	

British ferromanganese $100.00 delivered Atlantic seaboard duty-paid.

Domestic Prices at Works or Furnace—

Last Reported

	£ s d		French Francs		Belgian Francs		Reich §§Mark	
Fdy. pig iron, Si. 2.5	$20.30	4 19 0(a)	$15.07	679.30	$18.67	550	$25.20	63
Basic bess. pig iron	18.50	4 12 6(a)	....	....	....	....	27.80 (b)	69.50
Furnace coke	4.60	1 4 2	4.99	225	6.79	202	7.60	19
Billets	29.50	7 7 6	22.84	1,029	29.20	860	38.60	96.50
Standard rails	1.68c	9 10 0	1.41c	1,405	2.06c	1,375	2.38c	132
Merchant bars	2.05c	11 12 0††	1.32c	1,304	1.99c	1,300	1.98c	110
Structural shapes	1.84c	10 8 0††	1.27c	1,268	1.92c	1,250	1.93c	107
Plates, †¼-in. or 5 mm.	1.94c	10 19 3††	1.66c	1,650	2.06c	1,375	2.29c	127
Sheets, black	2.61c	14 15 0§	1.95c	1,958‡	2.42c	1,575‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	3.05c	17 5 0	2.86c	2,850	4.14c	2,700	6.66c	370
Plain wire	3.45c	19 10 0	1.98c	2,000	2.53c	1,650	3.11c	173
Bands and strips	2.12c	12 7 0††	1.45c	1,444	1.99c	1,300	2.29c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed. ††Rebate of 15s on certain conditions.

**Gold pound sterling not quoted. §§Last prices, no current quotations.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; †indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1	†12.00
Bos. dock No. 1 exp.	14.50
New Eng. del. No. 1	17.00-17.50
Buffalo, No. 1	20.00-20.50
Buffalo, No. 2	18.00-18.50
Chicago, No 1	19.00-19.50
Chicago, auto. no alloy	17.50-18.00
Chicago, No. 2 auto	15.50-16.00
Cincinnati, dealers	15.50-16.00
Cleveland, No. 1	19.75-20.25
Cleveland, No. 2	18.75-19.25
Detroit, No. 1	†15.50-16.00
Detroit, No. 2	†14.50-15.00
Eastern Pa., No. 1	21.50-22.00
Eastern Pa., No. 2	20.00-20.50
Federal, Ill.	15.50-16.00
Granite City, R. R.	16.50-17.00
Granite City, No. 2	15.50-16.00
Los Angeles, No. 1	12.50-13.00
Los Angeles, No. 2	11.50-12.00
L. A., No. 1 f.a.s.	15.00-16.00
L. A., No. 2 f.a.s.	14.00-15.00
N. Y. dock No. 1 exp.	16.50
Pitts., No. 1 (R. R.)	23.00-23.50
Pittsburgh, No. 1	22.50-23.00
Pittsburgh, No. 2	20.00-20.50
St. Louis, R. R.	16.50-17.00
St. Louis, No. 2	16.00-16.50
San Francisco, No. 1	12.50-13.00
San Francisco No. 2	11.50-12.00
Seattle, No. 1	11.00-12.00
Toronto, dirs, No. 1	9.75-10.25
Valleys, No. 1	22.00-22.50

COMPRESSED SHEETS

Chicago, factory	18.00-18.50
Chicago, dealers	17.00-17.50
Cincinnati, dealers	15.00-15.50
Cleveland	19.25-19.75
Detroit	†18.50-19.00
E. Pa., new mat	21.50-22.00
E. Pa., old mat.	18.50-19.50
Los Angeles	11.00-11.50
Pittsburgh	22.50-23.00
St. Louis	12.50-13.00
San Francisco	11.00-11.50
Valleys	21.00-21.50

BUNDLED SHEETS

Buffalo, No. 1	18.00-18.50
Buffalo, No. 2	15.00-15.50
Cleveland	15.75-16.75
Los Angeles	14.00
Pittsburgh	20.50-21.00
St. Louis	12.00-12.50
Toronto, dealers	8.50- 9.00

SHEET CLIPPINGS, LOOSE

Chicago	13.50-14.00
Cincinnati, dealers	10.50-11.00
Detroit	†13.50-14.00
†Los Angeles	3.75- 4.00
St. Louis	10.50-11.00
Toronto, dealers	4.75- 5.25

BUSHELING

Buffalo, No. 1	18.00-18.50
Chicago, No. 1	17.50-18.00
Cincin., No. 1, deal.	10.00-10.50
Cincinnati, No. 2	4.00- 4.50
Cleveland, No. 2	11.50-12.00
Detroit, No. 1, new	†16.00-16.50
Valleys, new, No. 1	19.50-20.00
Toronto, dealers	4.25- 4.75

MACHINE TURNINGS (Long)

Birmingham	†4.50- 5.00
Buffalo	11.50-12.00
Chicago	12.00-12.50
Cincinnati, dealers	7.00- 7.50
Cleveland, no alloy	9.00- 9.50
Detroit	†9.50-10.00
Eastern Pa.	14.00-14.50
Los Angeles	5.00
New York	†6.50- 7.00
Pittsburgh	14.00-14.50
St. Louis	7.50- 8.00
San Francisco	5.00
Toronto, dealers	4.75- 5.25
Valleys	13.50-14.00

SHOVELING TURNINGS

Buffalo	13.00-13.50
Cleveland	11.00-11.50
Chicago	12.50-13.00
Chicago, spcl, anal.	13.50-14.00
Detroit	†11.50-12.00
Pitts., alloy-free	16.00-16.50

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†5.75- 6.00
Buffalo	11.50-12.00
Cincinnati, dealers	6.00- 6.50
Cleveland	11.00-12.00
Eastern Pa.	11.50-12.00
Detroit	†8.50- 9.00
New York	†3.50- 4.00
Pittsburgh	11.50-12.00
Toronto, dealers	4.00- 4.50

AXLE TURNINGS

Buffalo	15.00-15.50
Boston district	†10.00-10.50
Chicago, elec. fur.	19.50-20.00
East. Pa. elec. fur.	19.50-20.00
St. Louis	12.50-13.00
Toronto	4.50- 4.75

CAST IRON BORINGS

Birmingham	†6.00- 6.50
Boston dist. chem.	†8.00- 8.50
Buffalo	11.50-12.00
Chicago	11.50-12.00
Cincinnati, dealers	6.00- 6.50
Cleveland	11.00-12.00
Detroit	†8.50- 9.00
E. Pa., chemical	10.00-11.00
New York	†3.50- 4.00
St. Louis	7.50- 8.00
Toronto, dealers	4.25- 4.75

RAILROAD SPECIALTIES

Chicago	21.50-22.00

ANGLE BARS—STEEL

Chicago	22.00-22.50
St. Louis	19.00-19.50

SPRINGS

Buffalo	22.00-22.50
Chicago, coil	22.50-23.00
Chicago, leaf	21.00-21.50
Eastern Pa.	23.50
Pittsburgh	27.00-27.50
St. Louis	20.00-20.50

STEEL RAILS, SHORT

Birmingham	†12.00-12.50
Buffalo	22.00-22.50
Chicago (3 ft.)	21.00-21.50
Chicago (2 ft.)	22.50-23.00
Cincinnati, dealers	22.50-23.00
Detroit	†22.50-23.00
Los Angeles	15.00-15.50
Pitts., 3 ft. and less	27.00-27.50
St. Louis, 2 ft. & less	20.50-21.00

STEEL RAILS, SCRAP

Boston district	†15.50-16.00
Buffalo	20.00-20.50
Chicago	18.50-19.00
Cleveland	20.00-20.50
Pittsburgh	25.50-26.00
St. Louis	17.50-18.00
Seattle	16.00

FROGS, SWITCHES

Chicago	19.00-19.50
St. Louis, cut	17.00-17.50

ARCH BARS, TRANSOMS

St. Louis	19.00-19.50

PIPE AND FLUES

Chicago, net	14.50-15.00
Cincinnati, dealers	10.50-11.00

RAILROAD GRATE BARS

Buffalo	14.50-15.00
Chicago, net	13.00-13.50
Cincinnati, dealers	9.75-10.25
Eastern Pa.	18.00-18.50
New York	†12.00-12.50
St. Louis	12.00-12.50

RAILROAD WROUGHT

Birmingham	†11.00-11.50
Boston district	†9.50-10.00
Eastern Pa., No. 1	21.50-22.00
St. Louis, No. 1	12.50-13.00
St. Louis, No. 2	16.00-16.50

FORGE FLASHINGS

Boston district	†12.25-12.75
Buffalo	18.00-18.50
Cleveland	18.00-18.50
Detroit	†15.00-15.50
Los Angeles	9.00
Pittsburgh	19.50-20.00

FORGE SCRAP

Boston district	†7.00
Chicago, heavy	22.50-23.00

LOW PHOSPHORUS

Cleveland, crops	17.50-18.00
Eastern Pa., crops	26.00
Pitts., billet, bloom, slab crops	28.00-28.50

LOW PHOS. PUNCHINGS

Buffalo	22.00-22.50
Chicago	21.50-22.00
Cleveland	20.00-21.00
Eastern Pa.	24.50-25.00
Pittsburgh	23.50-24.00
Seattle	15.00
Detroit	†17.50-18.00

RAILS FOR ROLLING

5 feet and over

Birmingham	†14.00-15.00
Boston	15.00-15.50
Chicago	22.00-22.50
New York	†18.50-19.00
Eastern Pa.	23.50-24.00
St. Louis	19.75-20.25

STEEL CAR AXLES

Birmingham	†15.00-16.00
Boston district	†16.50-17.00
Chicago, net	21.50-22.00
Eastern Pa.	24.50-25.00
St. Louis	21.00-21.50

LOCOMOTIVE TIRES

Chicago (cut)	20.50-21.00
St. Louis, No. 1	18.00-18.50

SHAFTING

Boston district	†18.00-18.50
New York	†18.00-19.00
Eastern Pa.	24.00-25.00
St. Louis, 1¼-3¾"	19.50-20.00

CAR WHEELS

Birmingham	†13.50-14.00
Boston dist., iron	†10.00
Buffalo, steel	22.00-22.50
Chicago, iron	19.00-19.50
Chicago, rolled steel	21.50-22.00
Cincin., iron, deal.	17.50-18.00
Eastern Pa., iron	22.50-23.00
Eastern Pa., steel	25.00
Pittsburgh, iron	21.00-21.50
Pittsburgh, steel	27.00-27.50
St. Louis, iron	19.00-19.50
St. Louis, steel	20.00-20.50

NO. 1 CAST SCRAP

Birmingham	†13.00-13.50
Boston, No. 1 mach.	†16.00-16.50
N. Eng. del. No. 2	18.00-19.00
N. Eng. del. textile	20.00-25.00
Buffalo, cupola	19.00-19.50
Buffalo, mach.	20.00-20.50
Chicago, agri. net	15.50-16.00
Chicago, auto net	16.50-17.00
Chicago, railroad net	16.50-17.00
Chicago, mach. net	17.00-17.50
Cincin., mach. deal.	18.50-19.00
Cleveland, mach.	19.50-20.00
Detroit, cupola, net	14.50-15.00
Eastern Pa., cupola	23.00
E. Pa., mixed yard	20.00
Los Angeles, net	13.00-13.50
Pittsburgh cupola	22.00-22.50
San Francisco, del.	12.50-13.00
Seattle	13.50-14.50
St. Louis, cupola	15.00-15.50
St. Louis, agri. mach.	16.00-16.50
St. L., No. 1 mach.	16.00-16.50
San Francisco	12.50-13.00
Toronto, No. 1, mach., net, dealers	15.00-15.50

HEAVY CAST

Boston dist. Break	†14.00-14.50
New England, del.	16.00-17.00
Buffalo, break.	16.50-17.00
Cleveland, break, net	13.00-13.50
Detroit, auto net	16.00-16.50
Detroit, break.	12.50-13.00
Eastern Pa.	21.00-21.50
Los Ang., auto, net.	13.50
New York, break.	†15.50-16.00
Pittsburgh, break	19.00-19.50

STOVE PLATE

Birmingham	†7.50- 8.00
Boston district	†13.00-14.00
Buffalo	15.00-15.50
Chicago, net	12.50-13.00
Cincinnati, dealers	9.75-10.25
Detroit, net	†9.50-10.00
Eastern Pa.	18.00-18.50
New York, fdy.	†12.00
St Louis	11.50-12.00
Toronto dealers, net	9.00- 9.50

MALLEABLE

Birmingham, R. R.	†10.50-11.00
New England, del.	11.50-12.50
Buffalo	20.00-20.50
Chicago, R. R.	21.50-22.00
Cincin., agri., deal.	15.00-15.50
Cleveland, rail	21.50-22.00
Eastern Pa., R. R.	21.00-22.00
Los Angeles	15.00
Pittsburgh, rail	22.00-22.50
St. Louis, R. R.	16.50-17.00

Iron Ore

Lake Superior Ore

Gross ton, 51½ %

Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbessemer	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbessemer	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-9.25
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, c.i.f. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man.	nom.
No. Afr. low phos.	nom.
Swedish low phos.	nom.
Spanish No. Africa basic, 50 to 60% nom.	nom.
Tungsten, short ton unit, duty pd. nom.	$23.75-25.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$23.00-24.00
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	0.75

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52% nominal	50.00
So. African, 50-52% nominal	50.00
Indian, 49-50%	nom.

—The Market Week—

Sheets, Strip

Sheet & Strip Prices, Pages 70, 71

Pittsburgh — Sheet and strip production still is rising, sheet operations recently having topped 75 per cent. It is doubted if output can be pushed much above the 87 per cent peak attained in 1937. Pressure from buyers may result in announcement of first quarter prices shortly. Order departments still are sorting the heavy bookings received the past few weeks, but definite delivery dates will be available soon on most orders. Galvanized sheet production, close to 75 per cent, is nearing the 1937 peak of 77 per cent.

Cleveland — Sheet and strip producers still are attempting to determine what, if any, additional business can be accepted for shipment before January. Capacity already is heavily engaged and some sellers are out of the market on a number of grades. Automotive requirements in the new quarter apparently will be larger than was expected a short time ago.

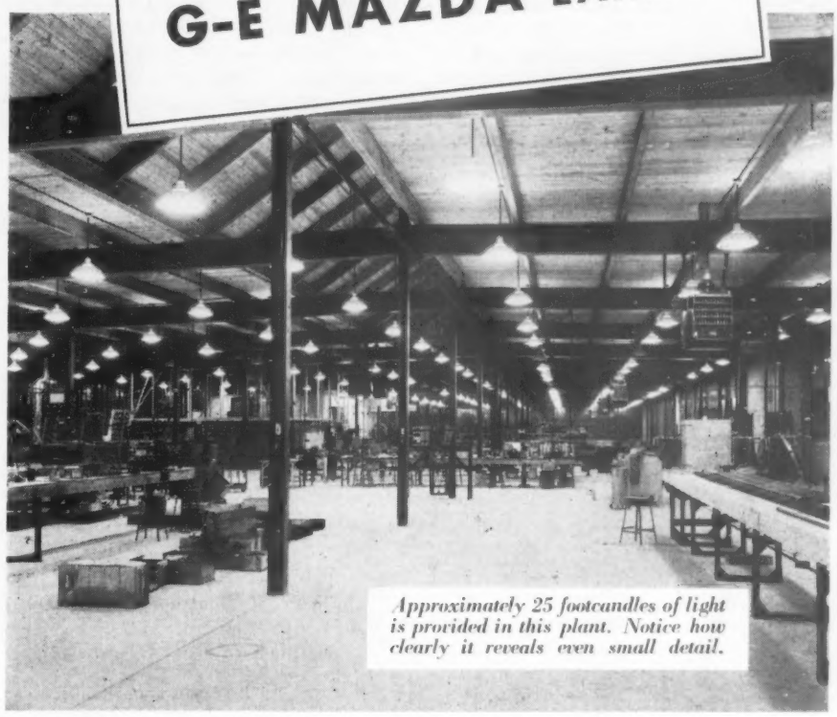
Chicago—Sheet and strip production continues practically at capacity. Fourth quarter coverage has been extremely heavy, with some consumers still experiencing difficulty in filling needs. Most flat-rolled divisions report being almost sold out for the remainder of the year.

Boston—Narrow cold strip mills are generally booked solid through the remainder of the year and are not taking orders for shipment beyond Dec. 31 unless subject to price adjustment. Sheet buying has subsided somewhat, but specifications against old orders continue good. Sheet and strip consumption does not appear to have kept pace with buying, indicating a substantial part of the tonnage is for inventory.

New York — Shipments continue heavy, but sheet specifications are leveling off. In most cases buyers are well covered for the present and are less concerned about getting on mill schedules, especially where it is known that tonnage cannot be handled this year. Stove makers are active sheet users, the result of a spurt in light apartment and residential work. Prices are featured by an increase of $5 a ton on hot-rolled sheets by two eastern mills. These mills produce sheets in only a relatively limited number of gages.

Cold strip producers in the East are swamped with orders and a bottleneck in production has developed at some mills in scheduling the work. Practically all are at 100

BETTER LIGHT WITH THE NEW, BRIGHTER G-E MAZDA LAMPS



Approximately 25 footcandles of light is provided in this plant. Notice how clearly it reveals even small detail.

Acme Electric & Mfg. Co. plant is Light-Conditioned

THE Acme Electric and Manufacturing Company's Cuba, New York plant is a good example of a light-conditioned factory . . . where there is the right amount of light and the right kind of lighting for easy seeing. This plant manufactures electric transformers . . . work involving close, accurate seeing that requires adequate light.

Good light is provided by 500 watt G-E MAZDA lamps in Glassteel diffusers mounted 13 feet above the floor and spaced on 11′ x 13′ centers.

Proper illumination for doing accurate work is a necessity in every factory. It helps everyone see more easily, work with less fatigue, and do a more efficient job.

Like many other industrial plants, the Acme Electric and Manufacturing Company uses the new, brighter G-E MAZDA lamps because they stay brighter longer, and so give more light for the current consumed.

Send today for a free copy of "Lighting for Production in the Factory." Write to General Electric Co., Dept. 166-S-J, Nela Park, Cleveland, Ohio.

Light Sensitive Cell
USE A G-E LIGHT METER
to check your lighting.
With a G-E Light Meter you can measure lighting in your plant and see if it meets modern seeing standards. Costs $11.50.

G-E MAZDA LAMPS

GENERAL ELECTRIC

per cent capacity. Producers have turned down hundreds of tons in some instances to cover regular customers through the quarter at current prices and are taking orders for shipment after Dec. 31 only at open prices prevalent at time of shipment.

Buffalo—Some of the tension in sheet and strip markets is lifting, so far as pressure for immediate shipment is concerned, but mills are pushing operations as much as possible.

Philadelphia—Several mills report backlogs on hot and cold rolled and galvanized sheets at 12 weeks and more. Some consumers are asking first quarter protection at prices then prevailing. Consumption is increasing, but part of current shipments is going into stock.

Cincinnati—Releases are heavier, especially from the automobile industry, and there is no evidence large tonnages are being added to inventories. Inquiries continue heavy, although orders are being rejected for fourth quarter shipment. Rolling schedules are being expanded as rapidly as possible, but delayed deliveries are in prospect.

St. Louis—Sheet mill capacity the remainder of the year is being absorbed rapidly, and in some instances allotment is being resorted to in order not to work a hardship on customers slow in ordering.

Birmingham, Ala.—Sheets, both roofing and manufacturers', are on a greatly increased schedule. Production at the Fairfield mill is better at 80 per cent, according to unofficial estimates.

Heavy demand for cotton ties has greatly accentuated output of strip. Although stocks had been stored against future demand, mills have been forced to step up production considerably.

Shafer concave roller design with matching convex races combines in a simple and efficient bearing assembly: 1. Rolling self-alignment as an inherent feature of the bearing itself; 2. Thrust capacity with loads distributed over the whole face of the bearing; 3. Provision for simple adjustability.

Only Shafer offers all these features in the same bearing—to insure long life and dependable bearing performance even under severe operating conditions.

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Available in a full range of sizes: Pillow Blocks • Welded Steel Pillow Blocks • Flange Units • Take-up Units • Hanger Boxes • Cartridge Units • Flange-Cartridge Units • Duplex Units • Conveyor Rolls • Radial-thrust Roller Bearings

SHAFER *Self-Aligning*
ROLLER BEARINGS

Plates

Plate Prices, Page 70

Boston — Buying is slow to improve, due largely to the lack of specified work. Fabricating shops in most instances are consuming more material, and demand by shipyards is steady. Two eastern mills have advanced prices $5 a ton, while another whose material comes under the Boston delivered base had not followed late last week. Tank business is light, but railroad releases are slightly heavier.

New York — While two eastern plate mills have advanced prices $5 a ton, these increases have not yet been tested. The outcome will depend partly on what action is taken by other producers. All mills have good backlogs. Railroad equipment and shipyard specifications have been most prominent in the general pickup in plate demand. Oil company and public utility needs are expanding more rapidly.

Philadelphia — Lukens Steel Co. and Alan Wood Steel Co. have advanced plates $5 a ton, and other independent mills are expected to follow. A fair amount of business is reported to have been placed at the higher prices for nearby delivery. Pennsylvania railroad has released an estimated 10,000 tons of plates for its repair program, with additional tonnage to come later. Despite pressure from domestic consumers, some plate mills are willing to take export business at 2.35c, f.a.s.

Birmingham, Ala. — Plate bookings continue satisfactory. Most is in small lots but the aggregate is large. Indications are that mills will have additional substantial tonnage since announcement that Ingalls Shipbuilding Corp. has been

awarded a government contract totaling approximately $10,250,000.

Seattle — Fabricators report improved demand for small jobs, the aggregate showing increased totals, stimulated by seasonal work and the rising market. Bellingham, Wash., rejected bids for a water system intake involving 125 tons of plates. New bids will probably be asked.

San Francisco—So far this year 77,335 tons of plates have been booked, compared with 26,622 tons for the same period a year ago. Pending business includes 3000 tons for a 103-inch diameter welded or reinforced concrete pipe line for Los Angeles.

Plate Contracts Placed

350 tons, 24-inch welded steel pipe, Bremerton, Wash., to Beall Tank & Pipe Co., Portland, Oreg.

175 tons, four 10,000-barrel tanks, Carteret, N. J., to Graver Tank & Mfg. Co., East Chicago, Ind.

125 tons, 24-inch water pipe for Bremerton, Wash., to Beall Pipe & Tank Co., Portland, Oreg.

105 tons, small tanks, Chester, Pa., to Graver Tank & Mfg. Co., East Chicago, Ind.

Plate Contracts Pending

125 tons, intake pipe for Bellingham, Wash.; bids rejected and new bids expected.

Unstated, 200,000-gallon steel tank for Cathlamet, Wash.; bids Oct. 2.

Bars

Bar Prices, Page 70

Chicago—Merchant rail steel bars have been advanced $3 a ton to a parity with billet material, the increase reflecting the rapid increase in the price of rerolling rails. Quantity extras also have been revised, base quantity now being 5 tons and over instead of 15 tons and over. Separate sets of extras on smaller quantities have been established for total orders of 20 tons or more and for orders totaling less than 20 tons. These are reductions from former quantity extras.

Cleveland—Bar producers still are attempting to arrange mill schedules for tonnage on hand to determine future deliveries. Some orders have been turned down, in the absence of definite prices on shipments after this quarter. Buyers who recently had been operating with scant inventories have found themselves pinched in some cases by inability of mills to give prompt delivery of desired quantities.

Boston — Specifications continue brisk, but new buying has slackened. Bulk of volume is moving through and to jobbers. Alloy bar releases are relatively better than hot rolled material. Industrial consumption has improved and shipyard specifications are steady. Forging shop, bolt and nut specialty producers and government plant consumption is heavier.

New York—Bar specifications are leveling off. A large quantity of tonnage released in September is for actual consumption, but a substantial portion is going into stock In some lines, including cold-drawn bars, the large bulk of buying has been done by warehouses whose tonnage is not moving out as freely as was anticipated by some. Most producers are well booked ahead and in some items are not certain where they stand in the matter of deliveries.

Philadelphia—New extras which become effective this month have helped to drive in large tonnages the past few weeks. Warehouses are covered through the new quarter and partly through first quarter.

Birmingham, Ala.—Bar bookings

Most Short Circuits *In Motors*--Can Be Prevented

Nearly always they are due to oil escaping from bearings and soaking windings. The result is a short circuit and "burn-out".

NON-FLUID OIL stops this trouble. It does not leak or creep, nor is it thrown out of bearings by vibration. Motors are kept running steadily, with cool bearings and clean frames. Money is saved on lubricant and application cost, because NON-FLUID OIL lasts longer and needs less frequent renewal.

Used successfully in leading iron and steel mills. Send for testing sample today—prepaid—NO CHARGE.

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TRADE MARK REGISTERED IN U.S. PAT. OFFICE & FOREIGN COUNTRIES

NON-FLUID OIL

MODERN STEEL MILL LUBRICANT

Better Lubrication at Less Cost per Month

are brisk. Merchant bars are in better demand over the past two weeks and concrete reinforcing is especially active.

Pipe

Pipe Prices, Page 71

Pittsburgh — Export business is swelling books of tube mills. Domestic business is heavier, but the gain has been relatively less than in other products. Oil country export business is mainly from South America which has transferred orders from European mills to this country. Standard pipe specifications are slightly better. Mill schedules are not overcrowded, although production has been stepped up to about 70 per cent.

Chicago—Cast iron prices have been advanced $3 a ton for local delivery. The increase was attributed to the higher cost of pig iron, recently raised $2 a ton, and other materials.

New York—Cast pipe buying and inquiry is substantially more active and prices on all diameters have been increased $3 a ton, effective Sept. 25. New York city has increased its last purchase of about 13,800 tons by 50 per cent, buying close to 20,000 tons. An additional large inquiry is expected by New York this quarter which will also bring out several large steel pipe tonnages to be bought by the department of water supply, gas and electricity. Export demand has also improved and is active while utilities continue to buy well in advance of last year.

Steel pipe sellers are confronted with the heaviest demand since early 1937. Railroads and utilities are specifying heavily, and plumbing contractors are laying in the largest stocks in years. The latter is partly a seasonal development. Mill prices are unchanged, but the resale market is firming rapidly despite presence of some concessions.

Birmingham, Ala.—While somewhat below the general production rate pipe plants remain generally on a four and five day week.

Seattle—Rising prices have stimulated interest in cast iron pipe and proposed projects are being pushed. Considerable business is expected during the fourth quarter. H. G. Purcell, Seattle, has been awarded 550 tons of 4-inch and larger water pipe by Seattle. Vancouver, Wash., will receive figures Oct. 2 for 230 tons of 6, 8 and 10-inch cast pipe.

San Francisco—Cast iron pipe lettings were confined to lots of less than 100 tons and so far this year 24,492 tons have been placed, compared with 23,562 tons for the corresponding period in 1938. United States Pipe & Foundry Co. is low on 3500 tons of 4 to 16-inch pipe for the east bay municipal utility district, Oakland, Calif.

Cast Pipe Placed

550 tons, miscellaneous sizes, for Seattle, to H. G. Purcell, Seattle, representing United States Pipe & Foundry Co., Burlington, N. J.

Cast Pipe Pending

3500 tons, 4 to 6-inch, Class 150, east bay municipal utility district, Oakland, Calif.; United States Pipe & Foundry Co., Burlington, N. J., low.

2225 tons, City of Chicago; includes 100 tons 6-inch pipe, 1140 tons 8-inch pipe, and 985 tons 12-inch pipe; bids Oct. 10.

450 tons, 12 and 16-inch, Yonkers, N. Y.; bids in.

230 tons 6, 8 and 10-inch, for Vancouver, Wash.; bids Oct. 2.

Steel Pipe Pending

Unstated, 7800 feet 8 and 10-inch, for Goldendale, Wash.; bids Oct. 6.

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Dependability of manufacturer means customer confidence . . . that source of supply will remain constant. Dependability of product comes from constant maintenance of quality. Dependability of both manufacturer and product is of the utmost importance when considering sources of supply.

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BOLTS: Carriage • Machine • Lag • Plow • Stove • Elevator • Step • Tap • Wheel & Rim • Battery • U-Bolts • Tire • Automotive • Drilled • Faced • Special Heat Treated • Etc. NUTS: Cold Punched • Semi-Finished • Hot Pressed • Case Hardened • Slotted • Castle • Machine Screw • Marsden Lock • Low Sulphur • RIVETS: Standard • Tinners' • Coopers' • Culvert • Clevis and Hinge Pins • SCREWS: Cap • Machine • Hanger • Sheet Metal • Phillips Recessed Head • WASHERS: Plate • Burrs • MATERIALS: Steels • Alloys • Nonferrous Metals • Brass • Bronze • Everdur • Herculoy and others • RODS: Stove • Seat • Ladder • PLATED PARTS: Cadmium • Zinc • Chromium • Nickel • Hot Galvanized • Copper • Tin •

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SALES OFFICES: CHICAGO • DETROIT • PHILADELPHIA DENVER • SAN FRANCISCO • LOS ANGELES • SEATTLE • PORTLAND

9190

Wire

Wire Prices, Page 71

Pittsburgh—Wire mills are booked to capacity for the rest of the year. Deliveries have not yet become a serious problem in most products, although a pinch has appeared in some manufacturers' grades. Merchant demand is active, and allocation has been taking care of speculative buying. Prices on the latter are strong, some buyers being reported offering premiums in an attempt to get supplies.

Cleveland—Producers have heavy backlogs in wire and wire products but have not yet found it necessary to close books on business for shipment the remainder of the year. Orders on hand assure brisk production the next three months. Demand has been widely scattered, but producers have attempted to discourage overbuying. Automotive needs steadily are becoming more prominent.

Chicago — Buying is heavy in all wire and wire products. Prices, though decidedly firm, are not a factor, chief problem being protection for fourth quarter needs. Automobile needs are a large single source of demand, but many smaller sources are considerably more active than usual.

Boston—Pressure to get on wire mill books for delivery the fourth quarter covers a widely diversified list of products, and in more cases business is being turned down unless accepted at open prices for shipment after the first of the year. Finishing operations are practically 100 per cent in numerous departments. Some sales forces have been withdrawn for the time being. Demand for wire rods continues to keep pace with finished goods.

Rails, Cars

Track Material Prices, Page 71

Domestic freight car awards in September will likely come close to doubling the total of orders placed in the first eight months of this year. According to latest statistics 21,500 cars have already been placed and before the month actually expires it is considered possible that a total might be reached which would approximate twice the 12,456 placed earlier in the year.

Such a figure would bring the total for the first nine months up to more than 37,000, which would compare with 9953 cars in the first nine months of 1938, 49,706 in the corresponding period of 1937 and 37,313 in the same period in 1936.

Orders placed within the past week include an additional 1500 fifty-five-ton hoppers for the Norfolk & Western, 4000 cars for the New York Central, which will be built in the East Rochester, N. Y., shops of its subsidiary which is now known as Dispatch Shops Inc., and an additional 500 coal cars for the Reading, which will also be built in its own shops. Early action is expected on 275 freight cars by the New York, New Haven & Hartford.

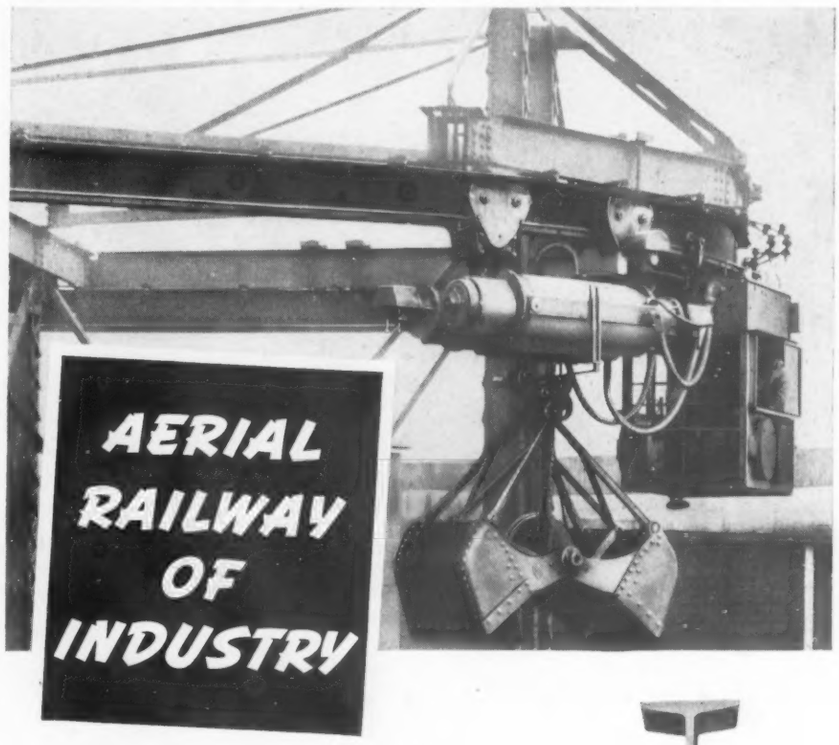
The $25,000,000 program, noted in a recent issue, as pending for the Canadian Pacific and Canadian National railways, is understood to include 4000 box cars, 500 flat cars, 200 refrigerator cars, 100 auto cars, 10 baggage and express cars and approximately 50 locomotives, which latter will likely be built at the Kingston and Montreal plants of the Canadian Locomotive Co.

Some important new rail tonnage is imminent in the East.

Car Orders Placed

Chicago & North Western, 800 cars; 300 box cars, to Mount Vernon Car Mfg. Co., Mount Vernon, Ill.; 500 seventy-ton hoppers to Pullman-Standard Car Mfg. Co., Chicago.

Erie, 1500 cars; 50 seventy-ton flat cars to Youngstown Steel Car Co., Niles,



• One Shepard Niles electric monorail hoist gives "express service", indoors or out to any point in the plant or yard carrying loads of every description. Furnished with single or double hooks in capacities from ⅛ to 10 tons.

They are also ideally suited to the accurate control of any standard electromagnet or grab bucket.

Write for catalogs illustrating and describing the "Aerial Railway of Industry".

Shepard Track consisting of two special analysis T-rails clamped to the bottom flange of a standard I-beam insures a smooth, hard, long-wearing track for monorail hoists.

A COMPLETE LINE OF CRANES & HOISTS

SHEPARD NILES CRANE & HOIST CORP.

358 SCHUYLER AVENUE . . . MONTOUR FALLS, N. Y.

O.; 500 boxcars to American Car & Foundry Co., New York; 250 gondolas to Greenville Steel Car Co., Greenville, Pa.; 400 fifty-ton boxcars to Pullman-Standard Car Mfg. Co., Chicago; 300 fifty-ton boxcars to General American Transportation Corp., Chicago.

Illinois Central, 2500 cars; 750 fifty-ton drop-bottom gondolas to General American Transportation Corp., Chicago; 750 fifty-ton hoppers to Pullman-Standard Car Mfg. Co., Bessemer, Ala.; 500 forty-ton boxcars to American Car & Foundry Co., St. Louis; 500 forty-ton boxcars to Mount Vernon Car Mfg. Co., Mount Vernon, Ill.

New York Central, 3500 hoppers and 500 boxcars, to Dispatch Shops Inc., East Rochester, N. Y., a subsidiary.

New York, Susquehanna & Western, two de luxe rail motor cars, to American Car & Foundry Co., New York.

Norfolk & Western, 1500 fifty-five ton hopper cars, divided equally among Virginia Bridge Co., Roanoke, Va.; Bethlehem Steel Co., Bethlehem, Pa.; and Ralston Steel Car Co., Columbus, O.; these are in addition to 2000 cars of the same type awarded previously to these same companies.

Reading Co., 500 hopper cars, reliably reported placed with own shops; in addition to 500 on which construction was started early in September as a part of a program first begun in 1937 and then temporarily suspend.

Union Pacific, 2000 light-weight steel box cars, to own shops.

Virginian, 500 hopper cars, to own shops; in addition to 500 noted earlier in the month.

Wisconsin Central, 100 automobile box and 100 flat cars, to Pullman-Standard Car Mfg. Co., Chicago.

Brazilian government, 1000 freight cars, to American Car & Foundry Co. and Pullman-Standard Car Mfg. Co.

Car Orders Pending

Baltimore & Ohio, 500 seventy-ton gondolas, pending; in addition to 1500 freight cars recently noted as being figured.

Chicago, Burlington & Quincy, 250 coal cars and 100 flat cars, which will either be bought or built in its own shops, in addition to the program of 1000 inaugurated early in September.

Delaware, Lackawanna & Western, 1100 cars; in addition to 600 coal cars being rebuilt in own shops.

Navy, 17 flat cars and five dump cars; bids Oct. 3.

New York, New Haven & Hartford, 500 to 1000 box cars, in addition to 250 hopper cars noted previously.

Royal State Railways of Siam, car underframes, bids Dec. 6; specifications available through Messrs. Sandberg, 25 Broadway, New York.

Rail Orders Placed

Chicago, Milwaukee, St. Paul & Pacific, 30,000 tons to Carnegie-Illinois Steel Corp. and Inland Steel Co., Chicago.

Illinois Central, 10,600 tons; 400 tons to Tennessee Coal, Iron & Railroad Co., 3300 tons each to Carnegie-Illinois Steel Corp. and Inland Steel Co.

Nashville, Chattanooga & St. Louis, 2400 tons, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Southern, 26,000 tons, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.; also 10,600 tons tie plates and 14,000 angle bars.

Southern Pacific, 60,000 tons; divided among Columbia Steel Co., San Francisco, Bethlehem Steel Co., Bethlehem, Pa., and Colorado Fuel & Iron Corp., Denver; 19,300 tons accessories also, to same suppliers and others.

Rail Orders Pending

Mobile & Ohio, 3000 tons; court permission granted.

St. Louis-San Francisco, court permission asked for purchase 10,000 tons 112-pound rails, to replace 60 miles track in 1940 program.

Locomotives Placed

Chicago, Milwaukee, St. Paul & Pacific, 10 locomotives, to Baldwin Locomotive Works, Philadelphia.

Louisville & Nashville, two diesel-electric locomotives, one to Electro-Motive Corp., La Grange, Ill., and one to American Locomotive Co., New York.

Seaboard Air Line, seven 2000-horsepower diesel-electric passenger locomotives, to Electro-Motive Corp., La Grange, Ill.

Locomotives Pending

Chicago, Burlington & Quincy, 10 steam and four diesel locomotives, purchase authorized.

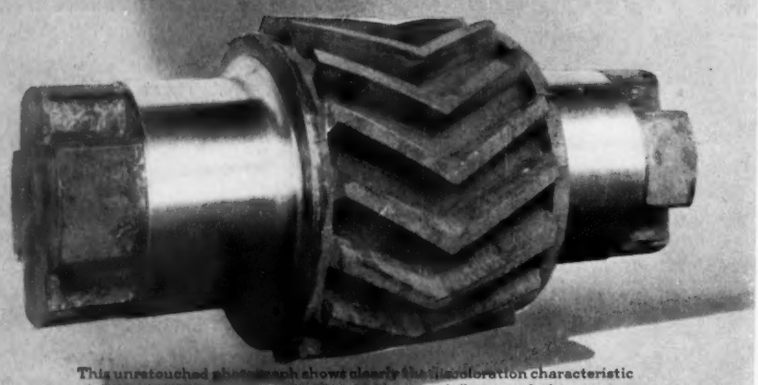
Tin Plate

Tin Plate Prices, Page 70

Operations are being pushed near the limit of available capacity, output being up 3 points last week to 83 per cent. Export orders are heavy, with inquiries continuing active. In some districts hot mills which have been long idle may be started up shortly.

Nelloy steel mill pinion

FLAME HARDENED TEETH AND WABBLERS



This unretouched photograph shows clearly the thin coloration characteristic of flame hardening on the teeth, wabblers, and flanges of this pinion.

SPECIAL Steel for special requirements is daily routine at the National-Erie Corporation .. For instance, this large flame-hardened herringbone mill pinion with 16 cast teeth, 6.283" circular pitch, 25" face, 32" pitch diameter, 35.144" outside diameter shaft 6' 1½" over all. Weight unmachined 12,620 lbs. . . Machined, 11,200 lbs. . . Put YOUR problem up to National-Erie .. take advantage of National-Erie's prompt efficient service and the cost savings that go with One Responsibility .. One Control.

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Shapes

Structural Shape Prices, Page 70

Pittsburgh — Structural awards and inquiries have spurted, with private work helping to swell the totals. Shape capacity of mills is adequate, but fear of higher prices is credited with the speeding of some work. Private orders include 1000 tons for an expansion program of United Engineering & Foundry Co.

Chicago—Fabricated shape business is heavier, with mills attempting to minimize speculatitve buying by requiring that specific structural projects be identified. Orders are headed by 3000 tons for a building addition, Houston, Tex.

New York — Inquiry is heavier, notably for New York state bridges and apartment buildings. The largest award includes 4200 tons for a subway section. More private work is also coming out.

Fabricated shape shipments in August totaled 137,632 tons, compared with 105,699 tons in July and 98,602 tons in August, 1938. according to the American Institute of Steel Construction, the highest total for any month this year. New contracts closed in August totaled 98,452 tons, compared with 110,176 tons in July. Backlogs for fabrication at the end of August totaled 428,984 tons.

Philadelphia—The number of new jobs has not increased appreciably, but mill backlogs have been swelled by active fabricator buying. One small mill has increased prices on small tonnages $5 a ton.

San Francisco—The largest structural letting went to Bethlehem Steel Co., 700 tons for a power plant and storehouse at the naval air base, Alameda, Calif. Judson-Pacific Co. secured 229 tons for the Russian river bridge near Hopland, Mendocino county, Calif., for the state and Moore Drydock Co. took 165 tons for an addition to the Paraffine Co. plant in Oakland, Calif.

Shape Awards Compared

	Tons
Week ended Sept. 30	24,224
Week ended Sept. 23	24,408
Week ended Sept. 16	47,130
This week, 1938	50,088
Weekly average, year, 1938	21,568
Weekly average, 1939	22,706
Weekly average, August ...	18,739
Total to date, 1938	789,986
Total to date, 1939	885,523

Includes awards of 100 tons or more.

Shape Contracts Placed

4250 tons, subway, route 101, section 6-B, Brooklyn, to American Bridge Co., Pittsburgh.

3000 tons, Esperson building addition, Houston, Tex., to Virginia Bridge Co., Roanoke, Va.

1550 tons, grade separation, Louisville, Ky., to American Bridge Co., Pittsburgh.

1250 tons, apartment, Ninety-second street and Park avenue, New York, to Harris Structural Steel Co. Inc., New York.

1000 tons, buildings, United Engineering & Foundry Co., Youngstown, O., to Fort Pitt Bridge Works, Pittsburgh.

965 tons, store house, navy yard, Norfolk, Va., to Virginia Bridge Co., Roanoke, Va.

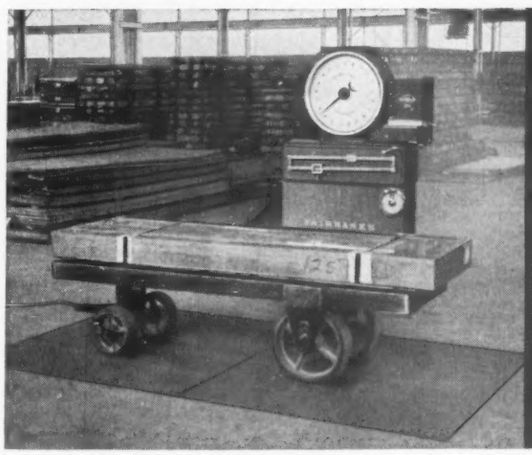
900 tons, apartment house, 50 Park Avenue Inc., New York, to Bethlehem Fabricators, Bethlehem, Pa.

785 tons, air corps hangar, Kelley Field, Texas, to Austin Bros., Dallas, Tex.

775 tons, apartment building, Thirty-seventh street and Park avenue, New York, to Bethlehem Fabricators Inc., Bethlehem, Pa.

755 tons, bridge 101-102, Eau Claire

A Matter of Record!



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Scales

Behind the Scenes with STEEL

A Week In Pittsburgh

■ Last week in Buffalo, with scrap prices soaring, nine manhole covers were stolen from the streets, unemployment dropped to new lows and steel operations edged up and up. And at the fountain head of such nearly-forgotten activity, the iron and steel engineers of this so very fortunate country crowded into Pittsburgh's William Penn hotel for their 35th annual convention with us on hand.

■ By actual count, according to reliable sources, the tired feet and other weary appendages of Pittsburgh visitors were soothed at no less than 60 bars within the confines of the hotel. We hesitated at a few but found none better than the "Bar Mill" constructed especially for the session by United Engineering & Foundry Co. According to some of the old-timers we talked to, the products coming out of that mill bore the finest finish in America.

■ We really should have this whole issue to do justice to what we did and saw. Some 900 of us took what is rumored to be the last inspection trip to be allowed through the "most modern steel mill in the world,"—the Irvin works of Carnegie-Illinois. We thoroughly enjoyed a complete Swedish Smorgasbord (with real *aquavit*) specially prepared and served by the hospitable SKF crowd from Philadelphia.

■ We saw a hundred exhibits jampacked with interested steel men, and we helped be of a little service in our own booth which we picture here as seen by our box Brownie. We even got dressed up and listened to B. F. Fairless deliver a speech in the center of the hotel lobby where because of its size, the formal banquet had to be held.

■ But, if we live to be a hundred and two we'll never enjoy anything more or remember it with greater pleasure than meeting and knowing Hugh N. Pendleton, for 40 years with National Tube's McKeesport works and now the assistant superintendent of the skelp mill. What a guy! As soon as you see him you have to like him and as you watch his sparkling eyes and catch on with his deep chuckle you openly love him. He has just a few short months before he is eligible for retirement, and he looks forward to a chicken farm down at his West Virginia birthplace and a huge rambling house to hold his visiting children. With a heart as young as spring and tough as steel he goes on toward the end of a remarkable career with all the enthusiasm he had in 1900 when he started out at $1.45 for a 10-hour day. The master entertainer, with a superb baritone voice, he is the perfect picture of the conscientious, hard-working, lovable boys who have made the steel industry what it is today and will be tomorrow. Our hats are off to H. N. Pendleton and we wish him a happy and well-deserved rest.

SHRDLU

—The Market Week—

county, Wisconsin, to Duffin Iron Works, Chicago.

700 tons, power plant and storehouse, naval air base, Alameda, Calif., specification 8990, to Bethlehem Steel Co., San Francisco.

690 tons, bridge, Salamanca, Cattaraugus county, New York, to Lackawanna Steel Construction Co., Buffalo; Admiral Construction Co., Buffalo, low on general contract.

645 tons, apartment building, 170 East Seventy-seventh street, New York, to Drier Structural Steel Co., New York, through Arthur Diamond Co.

625 tons, industrial building, Northam-Warren, Stamford, Conn., to Belmont Iron Works, Philadelphia.

360 tons, factory building, Bohn Aluminum & Brass Corp., Adrian, Mich., to Whitehead & Kales, Detroit.

360 tons, gun sheds, Fort Totten, Long Island, N. Y., to Belmont Iron Works, Eddystone, Pa.

325 tons, bridge, Greenpoint Avenue-Forty-third street, Queens, N. Y., to American Bridge Co., Pittsburgh.

315 tons, state bridge, East 168th street, New York, to Bethlehem Steel Co., Bethlehem, Pa.

310 tons, store building, Hempstead, N. Y., to Lehigh Structural Steel Co., Allentown, Pa.

300 tons, Chatham Fields housing project, Chicago, to Reuter Bros., Chicago

275 tons, factory building, Schacht Rubber Co., Noblesville, Ind., to Central States Bridge & Structural Co., Indianapolis, Ind.

270 tons, bridge, Baggs, Wyo., to Des Moines Steel Co., Des Moines, Ia.

270 tons, building 43A, American Cyanamid Co., Pearl River, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

255 tons, State street subway contract 86- Chicago, to American Bridge Co., Pittsburgh.

229 tons, Russian River bridge near Hopland, Mendocino county, Calif., for state, to Judson-Pacific Co., San Francisco.

225 tons, state highway bridge, Rockland county, New York, to Harris Structural Steel Co. Inc., through E. V. Chapell, Rome, N. Y., contractor.

215 tons, spillway bridge, Hiwassee project, North Carolina, to Midland Structural Steel Co. Cicero, Ill.

200 tons, state highway bridge, Luzena, Ariz., to Virginia Bridge Co., Roanoke, Va.

200 tons, state bridge FAGM-8538, Ft. Edward, N. Y., to Phoenix Bridge Co., Phoenixville, Pa.

200 tons, bridge, Mission street, Pittsburgh, for city, to Bethlehem Steel Co., Bethlehem, Pa.

190 tons, Loyalhanna dam, Saltsburg, Pa., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

175 tons, state highway bridge, Lawrence, Mass., to Groisser & Schlager Iron Works, Somerville, Mass.

165 tons, addition to plant of Paraffine Co., Oakland, Calif., to Moore Drydock Co., Oakland, Calif.

160 tons, underpass, Cochise county, Arizona, for state, to unstated interest.

155 tons, bottling plant, Shreveport, La, to Mosher Steel Co., Dallas, Tex.

155 tons, boiler house, Bound Brook, N. J., to Savary & Glaeser, Dunnellan, N. J.

150 tons, subway, Marshall street bridge, Youngstown, O., to American Bridge Co., Pittsburgh.

140 tons, foundry building, Bendix Aviation Corp., Bendix, N. J., to Truscon

Steel Co., Youngstown, O.

135 tons, building for Sylvania Corp., Fredericksburg, Va., to Bethlehem Steel Co., Bethlehem, Pa.

135 tons, bridge section 2X-B, Champaign county, Illinois, to Mississippi Valley Structural Steel Co., Decatur, Ill.

130 tons, Santa Fe railroad warehouse, Chicago, to Hansell Elcock Co., Chicago.

120 tons, hangar, Northwest Airlines Inc., Chicago, to Joseph T. Ryerson & Son Inc., Chicago.

115 tons, Boys' club, Greenwich, Conn., to Bethlehem Contracting Co., Bethlehem, Pa.

100 tons, pattern storage building, Mare Island, Calif., navy yard, to Herrick Iron Works, Oakland, Calif.

Shape Contracts Pending

4000 tons, transmission towers, Bonneville dam, Oregon; Columbia Steel Co., San Francisco, low.

2500 tons, stores for Board of City Trusts, Chestnut and Eleventh streets, Pittsburgh; bids in; Ballinger & Co., Philadelphia, architects.

2500 tons, port warehouse, No. 1, 2, 3 and 4, Hickam Field, T. H., Invitation 6812-40-20 and an additional tonnage for depot supply warehouse No. 1, 2 and 3; bids Oct. 12.

2000 tons, northwest station, unit 7, Commonwealth Edison Co., Chicago.

2000 tons, factory building, Pratt & Whitney division, United Aircraft Corp., East Hartford, Conn.

1975 tons, warehouse, Lit Bros., Philadelphia, tonnage revised; includes 1475 tons bars.

1600 tons, bridge MS-39.14, for city of New York.

1500 tons, apartment building, 877 Fifth Avenue Co. Inc., New York.

1300 tons, seven highway bridges in Oklahoma; bids Oct. 24.

1200 tons, Madison office building, Washington; bids Oct. 4.

1200 tons, hospital pavilions, University of Pennsylvania, Philadelphia.

1100 tons, apartment house, Simon Bros., New York.

965 tons, race track grandstand, Albany, Calif.; bids opened.

900 tons, pier shed, Providence, R. I., for city.

900 tons, building, Johnson & Johnson, New Brunswick, N. J.

825 tons, stockhouse, Liebmann Breweries Inc., Brooklyn, N. Y.

725 tons, approach, Fourteenth street viaduct, Hoboken, N. J., for Hudson county.

725 tons, state bridge over Passaic river, Morris county, New Jersey.

700 tons, bridge, route 6, section 12, Passaic river, Montville, N. J.; Grey Construction Co., Morristown, N. J., low.

500 tons, storehouses, Frankford Arsenal, Philadelphia.

450 tons, angles, Goodyear Tire & Rubber Co., Akron, O.

430 tons, Livingston county, New York, includes 80 tons, reinforcing steel highway projects P. S. C. 5392 and R. C. 2575; bids Oct. 18.

350 tons, Indiana state highway bridges, bids Oct. 3.

350 tons, building alterations, Metropolitan Life Insurance Co., New York.

342 tons, Erie county, New York, grade separation, highway project, P. S. C. 4236; bids Oct. 18.

330 tons, Putnam county, New York, includes 90 tons reinforcing steel, grade separation project R. C. 4075; Thomas A. Brogan, Yonkers, N. Y., low bidder.

300 tons, overhead conveyor bridge, Westinghouse Electric & Mfg. Co., Mansfield, O.

300 tons, state bridge RC-4074-75, Brewster, N. Y.

280 tons, Delaware county, N. Y., includes 50 tons reinforcing steel, highway project F. A. S. 8534; E. V. Chappelle, Binghamton, N. Y., low bidder.

265 tons, auto storage building, Southern Pacific Co., San Francisco; bids opened.

265 tons, Nueces Bay power station, units 1 and 2, Central Power & Light Co., Corpus Christi, Tex.

256 tons, bridge at First street over Figueroa street, Los Angeles, bids opened.

243 tons, Arickaree River bridge, Yuma county, Colorado; general contract to Lawrence Construction Co., 112 South Elato street, Denver, at $78,933.

235 tons, Tioga county, New York, highway project R. C. 4078; bids Oct. 18.

235 tons, Allegany county, New York, grade separation project P. S. C. 6566; bids Oct. 18.

220 tons, Kentucky dam lock, Tennessee valley authority, Gravel Switch, Ky.

200 tons, traffic plates, various locations, for state of New York.

190 tons, state highway bridge, Cornland, Ill.

180 tons, hospital addition, South Nassau Community hospital, Oceanside, N. Y.

175 tons, state highway bridge, Fox Lake, Ill.

130 tons, bridges, Urania and Selma, La., Missouri Pacific railroad.

130 tons, Jefferson county, New York, grade separation, projects P. S. C. 5418 and 6043; bids close Oct. 18.

130 tons, plant addition, Paterson-Leitch Co., Cleveland.

125 tons, bridge, Lansing and Switch, Minn., Chicago, Milwaukee, St. Paul & Pacific railroad.

120 tons, women's dormitory, Miami university, Oxford, O.

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118 tons, two-span wide flanged beam bridge, 158 feet, Londonderry, Vt.; bids Oct. 6, Montpelier, Vt.

117 tons, (including reinforcing) bureau of roads pony truss span, Klickitat county, Washington; bids at Portland, Oct. 6.

115 tons, repairs to terminal, Railway Express Agency, New York.

110 tons, plate girder and wide flange I-beam bridge, Ludlow-Mt. Holley, Vt.; bids Oct. 6, Montpelier, Vt.

100 tons, Albany county, New York, including small tonnage reinforcing steel, highway bridge, project S. S. 39-18; Sheehan Contracting Corp., Albany, N. Y., low bidder.

Unstated, gates and hoists for Coulee and other reclamation projects; bids in at Denver.

Reinforcing

Reinforcing Bar Prices, Page 71

Pittsburgh—Rail steel reinforcing bars have been increased $2 a ton to 1.90c, base, to a parity with the billet bar price. An increase in the latter is not regarded an immediate likelihood although some producers are reported out of the market because mills are booked the remainder of the year on merchant and concrete bars. Reinforcing bar inquiries are heavier, including several private jobs.

Chicago — Bids are being taken Oct. 11 by the city on construction of the new south side filtration plant, which will involve approximately 11,000 tons of reinforcing steel. This is the largest project in recent years here.

Boston — Buying is featured by 2500 tons for a housing project in the Dorchester district, Boston. Several thousand tons for such work remain to be placed. Small inquiries are more numerous and prices are holding as a rule on this type of business.

Seattle—No large projects have developed but considerable tonnage is pending, including 480 tons for Washington state highway work. Northwest Steel Rolling Mills, Seattle, has taken 100 tons for miscellaneous state road jobs.

Concrete Bars Compared

	Tons
Week ended Sept. 30	**12,133**
Week ended Sept. 23	**7,676**
Week ended Sept. 16	**2,450**
This week, 1938	**8,756**
Weekly average, year, 1938	**6,959**
Weekly average, 1939	**9,702**
Weekly average, August	**7,894**
Total to date, 1938	**258,932**
Total to date, 1939	**378,404**

Includes awards of 100 tons or more.

Reinforcing Steel Awards

2470 tons, Jamaica sewage treatment plant, South Ozone Park, New York, to Carroll & McCreary Co., Brooklyn, N. Y., through George F. Driscoll Co., Brooklyn, contractor.

2400 tons, housing project, Charleston district, Boston, to Morrison-Stevens Co., Boston; Northern Steel Co., Boston, to roll bars; John Bowen Co., Boston, contractor.

1000 tons, sewage treatment plant, Hammond, Ind., to Calumet Steel Co., Chicago.

1000 tons, dam, Franklin Falls, N. H., to Truscon Steel Co., Youngstown, O., through Coleman Bros. Corp., Boston, contractor.

670 tons, flood control project, Tell City, Ind., to Inland Steel Co., Chicago; Penker Construction Co., contractor.

538 tons, Panama canal, schedule 3589, to Youngstown Sheet & Tube Co., Youngstown, O.

500 tons, building, Deere Plow Works, Moline, Ill., to Laclede Steel Co., St. Louis.

400 tons, mesh, highway project RC4066, Harpersfield-Davenport, N. Y., to Bethlehem Steel Co., Bethlehem, Pa., through Robert E. Tompkins, Rochester, N. Y., contractor.

324 tons, mesh, highway project RC4067, Saratoga-Schuylersville, N. Y., to Truscon Steel Co., Youngstown, O., through Arute Bros. Inc., New Britain, Conn., contractor.

320 tons, three pumping stations, Wilkes-Barre, Pa., to Bethlehem Steel Co., Bethlehem, Pa.; B. C. Coon, contractor.

304 tons, bureau of reclamation, invitation 30,707-A and 30,708-A, Lapine, Oreg., to Columbia Steel Co., San Francisco.

300 tons, mesh, highway project RC4019, Madison- Onondaga counties, New York, to American Steel & Wire Co., Cleveland, through Provo Bros. Inc., Syracuse, N. Y., contractor.

250 tons, cells blocks, state prison, Walla Walla, Wash., to unnamed interest.

229 tons, Santa Paula River bridge, Ventura county, Calif., for state, to unnamed interest.

200 tons, Marguerite Hague hospital, Jersey City, N. J., to Bethlehem Steel Co., Bethlehem, Pa.; Auf de Hyde, contractor.

158 tons, bureau of reclamation, invitation 37,624-A, Deer Creek, Utah, to Columbia Steel Co., San Francisco.

152 tons, bureau of reclamation, invitation 48,216-A, Cody, Wyo., to Bethlehem Steel Co., Bethlehem, Pa.

150 tons, building, Standard Oil Co., Duluth, Minn., to Bethlehem Steel Co., Bethlehem, Pa.

150 tons, dynamometer laboratory, Wright's Field, Dayton, O., to Truscon Steel Co., Youngstown, O.; Simpson Construction Co., contractor.

150 tons, sewage treatment plant, Lockport, N. Y., to Buffalo Steel Co., Tonawanda, N. Y.; Couse & Saunders, Detroit, contractors.

133 tons, bureau of reclamation, invitation 30,704-A, Lapine, Oreg., to Judson Steel Corp., San Francisco.

118 tons, list 6068-E, treasury department, San Francisco, for Sonoma county, California, to W. S. Wetenhall Co., San Francisco.

117 tons, roads for naval air base, Alameda, Calif., to Ceco Steel Products Corp., San Francisco.

100 tons, Washington state highway work, to Northwest Steel Rolling Mills, Seattle.

Reinforcing Steel Pending

11,000 tons, filtration plant, Seventy-ninth street and the lake, Chicago; bids Oct. 11.

2500 tons, housing project, Dorchester district, Boston, to Concrete Steel Co., Boston; Rugo Construction Co., Boston, contractor.

900 tons, mesh and bars, New York state highway projects; bids in.

605 tons, highway project, contract MS-39-14, circumferential highway, Queens, N. Y.; Johnson-Drake & Piper, New York, low.

600 tons, Edgar Allen Poe homes, Baltimore, Md.; Consolidated Engineering Co., contractor.

575 tons, pressure culvert, United States engineers, Kingston, Pa.; Ralph Meyers, Salem, Ind., low on general contract.

500 tons, bridge, Greenpoint Avenue and Forty-third street, Queens, N. Y., to Jones & Laughlin Steel Corp., Pittsburgh; Tully & DiNapoli, New York, contractors.

500 tons, plant, Potomac Electric Power Co., Washington.

400 tons, Middletown Gardens housing project, Muncie, Ind.

350 tons, Coronett apartments, Milwaukee.

350 tons, dam, Spencer, Nebr.

350 tons, dam, Savage river, army engineers, Cumberland, Md.

300 tons, highway projects, Oklahoma; bids Oct. 24.

300 tons, primary tanks, Hammond, Ind.

237 tons, two seaplane hangars, naval air base, Alameda, Calif., specification 8621; bids opened.

240 tons, insurance building, Omaha, Nebr.

225 tons, school, Lead, S. Dak.

200 tons, building, Morrell Packing Co., Topeka, Kans.

198 tons, bridge, Dittmars avenue and Grand Central parkway, contract 1, Queens, N. Y. to Fireproof Products Co., New York; Corbetta Contracting Co., New York, contractor.

188 tons, bridges and highway work, Merced county, Calif., for state; bids Oct. 11.

180 tons, extension fourteenth street viaduct, Hoboken, N. J.; Joseph P. Scanlon Co., Jersey City, N. J., low.

130 tons, stadium, Lane Tech high school, Chicago.

125 tons, wharf storage building, Providence, R. I.

100 tons, Dooker Hollow bridge approach, Allegheny county, Pennsylvania.

Pig Iron

Pig Iron Prices, Page 72

Cleveland — September shipments were at least double those of August, and it is not unlikely fourth quarter deliveries will set a new record for the period. Some foundries are increasing proportion of iron in their melt, the result of sharp advances in scrap.

Pittsburgh—All of the district's blast furnaces in condition to operate are active, with additional stacks being repaired for service. Difficulties in furnishing a sufficient coke supply also are being remedied. The area has 36 of 50 stacks in blast. Demand for steelmaking iron is heavy, and most foundries have contracted for quarterly needs. Higher prices announced recently prevail on current business but volume now is small.

Chicago — September increase in shipments over August was about 120 per cent. Some iron still is being booked at the new $23 price, but most large users already have covered fourth quarter needs. More indicative of the trend in the foundry melt, coke shipments were up about 40 per cent in September. Two more blast furnaces went in last week.

Boston — Buying continues to show moderate improvement for fourth quarter delivery at the recent $2 advance. Third quarter with most sellers was the best of the year, with indications the next will also make a good showing.

New York — September brought the largest volume of new orders since early 1937 and the heaviest shipments in a number of years. However, buying has declined since the recent price advance, prior coverage having been brisk.

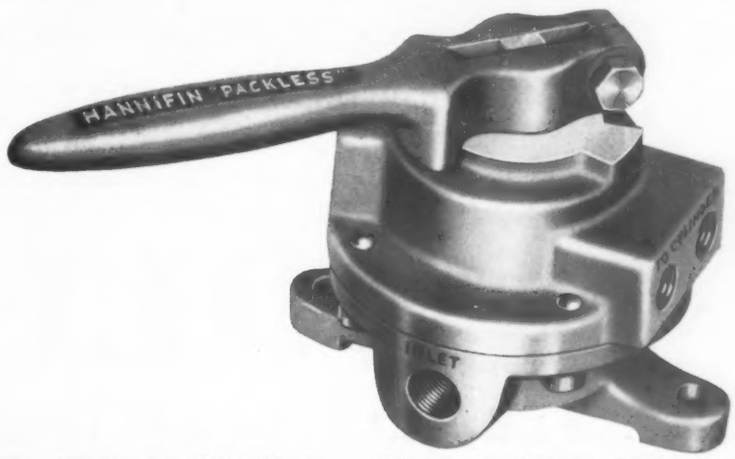
Philadelphia — Business at the higher prices is light, but consumers are taking tonnage rapidly. Demand reflects the sharp advance in scrap and heavier consumption. An additional merchant stack may be blown in within the next two weeks.

Buffalo—September shipments are estimated at 25 to 40 per cent ahead of August. Demand is heavy, but inventories of foundries still are low. The melt is expanding, many foundries now operating a full 40-hour week, with few running less than four days a week.

Cincinnati — Deliveries continue but new business is quieter since the recent advance. The melt is expanding gradually, with higher scrap prices a factor in pig iron demand.

St. Louis — Shipments and consumption continue to rise. Sharp gain in the melt will require some users to replenish stocks, despite apparently ample earlier coverage. Jobbing foundries are operating at the best rate in two years.

Toronto, Ont.—Canadian pig iron prices have been advanced $3 a ton. The new market is $25.50 for the base grade, 2.25 silicon and under, $26 for malleable and $25.50 for the basic, all delivered, Toronto. Montreal prices also are up $3, being $1.50 above Toronto figures.



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Scrap

Scrap Prices, Page 74

Pittsburgh—Prices are advancing more slowly, heavy melting steel moving up only 50 cents last week. However, the market continues strong and scrap is not readily available in large lots. Speculative buying is being done in some cases, but brokers generally are limiting sales.

Chicago—The market still is unsettled because of the absence of significant mill buying. Prices still are regulated largely by broker-dealer trading, and heavy melting steel moved up an additional $1.50 last week. There is some belief that the advance has been too rapid and that a leveling off is due.

Boston—Additional advances in many grades of iron and steel scrap, notably for Pennsylvania and New England delivery have developed. In some cases the gains are $2 to $3 a ton. Cast grades for New England delivery are especially strong. For delivery to Central Massachusetts, heavy melting steel has brought $17 to $17.50.

New York—Prices are up $2 on most grades for both domestic and export shipment. Scarcity of available ships has retarded buying for export, but demand for storage on barges continues. Domestic demand is more active for both steelmaking and foundry grades.

Philadelphia—The market continues highly unsettled, with prices again several dollars a ton higher. Reports that heavy melting steel has been sold at $23 are discounted, and it is believed the advance may be approaching a peak. However, some mills are short on supplies.

Buffalo—The rising trend of scrap prices shows no signs of abating, and higher quotations are bringing but little more material into the market. Dealers are hesitant to sell large lots at current prices, but mills also are cautious in buying.

Cincinnati—Dealers' buying prices again have been boosted, with heavy melting steel up $2 at $15.50 to $16. Higher quotations have failed to attract a large increase in offerings.

St. Louis—The market continues bullish, further sharp advances being recorded in all grades. Higher quotations are bringing out more scrap, but supplies still are relatively light. The country movement continues slow.

Toronto, Ont. — Prices are up 50 cents to $3, largest increases being in iron grades. The advance reflects the small volume of offerings. Some melters have been forced to raise their bid to obtain cast scrap.

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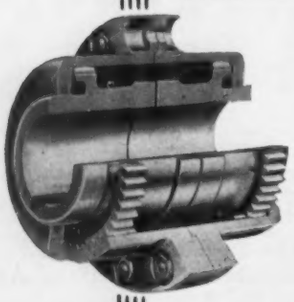

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Warehouse

Warehouse Prices, Page 73

Chicago — Demand continues to rise, warehouses beginning to feel moderate effects of congestion at mills. Galvanized sheet prices and quantity brackets have been revised, lots of 150 to 1499 pounds now being $6 a ton over the recent market on 500 to 1499 pounds. A similar increase has been made at Milwaukee. Item and quantity extras on cold-finished carbon bars have been increased.

New York—Accompanied by higher sheet prices, business has increased sharply. Galvannealed sheets advance $4 a ton Oct. 2 while enameling finishes will also go up, following the recent higher quotations for galvanized and black.

Detroit—Warehouses are not confronted with heavy demand current in mill sales offices, but are meet-

ing accelerated demand, due in part to a tendency to build up inventories moderately.

Philadelphia — Effective Oct. 2 warehouses have advanced plates and shapes 15 cents, hoops, bands, bars and floor plates 25 cents and hot-rolled sheets and cold-drawn carbon bars 10 cents. Business is increasing.

Cincinnati — Heavier individual orders have aided substantially in boosting warehouse tonnage. Expanding needs are indicated, and also a swerve from earlier, sparse buying policies.

Steel in Europe

Foreign Steel Prices, Page 73

London — (*By Cable*) — Iron and steel producers in Great Britain are endeavoring to fulfill normal contracts, subject to government requirements, which take precedence. Some export inquiry is being received from neutral countries. British imports in August were 236,920 tons, compared with 220,650 tons in July. Exports in August were 135,651 tons, compared wth 179,800 tons in July.

The Continent reports steel output in Belgium and Luxemburg has been reduced substantially but that French ore deliveries are improved. Export trade is extremely limited.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 71

Bolt and nut production is expanding, recently being at 65 to 70 per cent. Heavy specifications are coming from virtually all directions, warehouse, railroad and automotive needs being especially active. Export buying also has spurted, particularly from Central and South America and the Philippines. Export prices are close to a parity with domestic quotations.

Ferroalloys

Ferroalloy Prices, Page 72

Ferrotungsten has been advanced nominally 25 cents to $2.25 a pound contained tungsten, with tungsten metal powder also up 25 cents. This reflects further strength in tungsten ore, with Chinese wolframite now $23.75 to $25, duty paid, depending upon time of shipment. Manganese ore nominally is unchanged but strong. Imported iron ore prices continue highly unsettled and nominal.

Nonferrous Metals

New York — Despite heavy buying of metals earlier this month, consumers continued to inquire for

Nonferrous Metal Prices

Sept.	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin, New York: Spot	Straits Tin, New York: Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
23	12.00	12.12½	12.25	68.00	49.50	5.50	5.35	6.25	20.00	14.00	35.00
25	12.00	12.12½	12.25	68.00	49.50	5.50	5.35	6.25	20.00	14.00	35.00
26	12.00	12.12½	12.25	63.50	48.50	5.50	5.35	6.25	20.00	14.00	35.00
27	12.00	12.12½	12.25	63.00	48.00	5.50	5.35	6.50	20.00	14.00	35.00
28	12.00	12.12½	12.25	60.00	47.00	5.50	5.35	6.50	20.00	14.00	35.00
29	12.00	12.12½	12.25	60.00	47.00	5.50	5.35	6.50	20.00	14.00	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb., except as specified. Copper brass products based on 12.00c Conn. copper

Sheets

Yellow brass (high) 18.65
Copper, hot rolled 20.37
Lead, cut to jobbers 8.30
Zinc, 100 lb. base 11.25

Tubes

High yellow brass 21.40
Seamless copper 20.87

Rods

High yellow brass 13.97
Copper, hot rolled 16.87

Anodes

Copper, untrimmed 17.62

Wire

Yellow brass (high) 18.90

OLD METALS

Nom. Dealers' Buying Prices

No. 1 Composition Red Brass

New York 7.87½-8.00
Cleveland 9.00-9.25
Chicago 8.12½-8.37½
St. Louis 8.50-8.75

Heavy Copper and Wire

New York, No. 1 ..... 9.50-9.75
Cleveland, No. 1 ..... 9.50-9.75
Chicago, No. 1 ..... 9.62½-9.87½
St. Louis 9.75-10.00

Composition Brass Turnings

New York 7.50-7.75

Light Copper

New York 7.50-7.75
Cleveland 7.75-8.00
Chicago 7.62½-7.87½
St. Louis 7.75-8.00

Light Brass

Cleveland 4.50-5.00
Chicago 5.37½-5.62½
St. Louis 5.00-5.50

Lead

New York 4.85
Cleveland 4.50
Chicago 4.25-4.50
St. Louis 4.00-4.25

Zinc

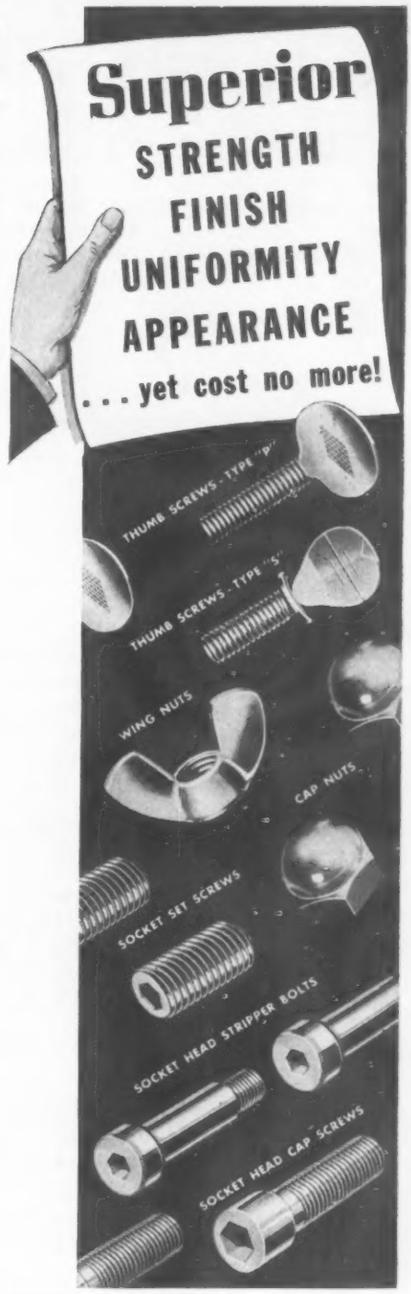
New York 3.50-3.75
Cleveland 3.00
St. Louis 3.50-3.75

Aluminum

Mixed, cast, Cleveland 8.25-8.50
Borings, Cleveland 6.75-7.00
Clips, soft, Cleveland 15.25-15.50
Misc. cast, St. Louis 8.00-8.25

SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads 13.75
Standard No. 12 aluminum ... 14.00-15.00



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additional tonnages last week which in many instances exceeded sellers' offerings. However, there appeared to be no threat of a shortage for actual needs and producers strove to stabilize the markets. Evidence that users have not bought excessively was seen in the rise in operations at copper and brass mills to 100 per cent of capacity, in lead consumption to near capacity, at tin plate mills to 83 per cent, and at sheet galvanizing plants to 74 per cent.

While copper and lead held firm, zinc prices advanced ¼-cent and spot tin declined rather sharply.

Copper — Producers continued to allocate sales and the turnover declined to around 2000 tons a day. Prices held firm at 12.00c, Connecticut, in the producers' market and at 12.37½c on the outside market. Export business has been negligible with prices ranging up to 12.00c f.a.s.

Lead — Sales in September were at a record pace with most producers often exceeding their day's intakes.

Zinc—A rather tight situation existed in zinc last week with several sellers having sold all the metal they have at present and several others booking only on an average price basis. Prices advanced on Wednesday to the basis of 6.50c, East St. Louis, for prime western.

Tin—Since no shipments of tin so far have been sunk or seized, the tight situation in Straits spot has been relieved considerably and prices have declined nominally to around 55.00c to 60.00c. Futures were available late last week at around 45.00c to 47.00c but sales were still a matter of individual negotiation. Many observers expect a further easing in the price situation, especially in spot.

Week's Walsh-Healey Purchases $2,036,057

WASHINGTON

■ During the week ended Sept. 23, the government purchased $2,036,057.91 worth of iron and steel products under the Walsh-Healey act as follows: Laclede Steel Co., St. Louis, $15,330.22; Advance Foundry Co., Dayton, O., $12,812; Bethlehem Steel Co., Bethlehem, Pa., $68,554; Westinghouse Electric & Mfg. Co., Washington, $36,975; Florence Pipe Foundry & Machine Co., Philadelphia, $18,447; Youngstown Sheet & Tube Co., Youngstown, O., $23,604.62.

Colorado Fuel & Iron Corp., Denver, $185,118.36; Bethlehem Steel Co., San Francisco, $11,733.83; Pacific States Steel Corp., San Francisco, $100,534; Jones & Laughlin Steel Corp., Pittsburgh, $14,234 (estimated); Carnegie-Illinois Steel Corp., Washington, $257,202.83 (estimated); Ross Galvanizing Works Inc., Brooklyn, N. Y., $10,712.50 (estimated); Hart Mfg. Co. Inc., Louisville, Ky., $13,209; Inland Steel Co., Chicago, $1,035,806.60; International-Stacey Corp., Columbus, O., $11,670.

Pennsylvania Forge Corp., Philadelphia, $27,790; Sherman & Reilly Inc., Chattanooga, Tenn., $66,077; Carnegie-Illinois Steel Corp., Chicago, $29,613.56 (estimated); South East Joslyn Co., Cincinnati, $58,732.02; American Steel & Wire Co. of N. J., St. Louis, $14,062.62 (estimated); Pettibone Mulliken Corp., Chicago, $12,827; and The P & M Co., Chicago, $10.975.75.

Semifinished

Semifinished Prices, Page 71

Pittsburgh—In an attempt to relieve the heavy demand for semifinished steel two companies here are starting up old blooming mills. One of these has not rolled for several years and the other only a few months in 1937. Export demand continues heavy, but mills have accepted little business despite premium prices being offered in some cases.

Construction and Enterprise

Ohio

CINCINNATI—Cincinnati Street Railway Co., Dixie Terminal building, has filed plans for new powerhouse; installation to include five boilers complete with stokers and accessories, other equipment.

DEFIANCE, O.—Lectrolite Corp., Harold L. Schlosser, president, is erecting plant addition to provide 6000 square feet floor space for manufacture of wrenches, pole line hardware, hot water heaters.

FAIRFIELD, O.—Constructing quartermaster, Wright Field, Dayton, O., is taking bids due 11 a.m. Oct. 5 for conversion of ice refrigerators to mechanical at Patterson field; bid guarantee 10 per cent required.

PEEBLES, O. — City, Edwin Fisher, mayor, will vote on $50,000 bond issue Nov. 7 to help finance sewage disposal plant costing $225,000, as WPA project. Walter Manion Construction Co., 914 Main street, Cincinnati, engineer.

PIONEER, O.—Village, C. B. Crommer, acting mayor, will vote on $30,000 bond issue for waterworks system, Nov. 7. Champe, Finkbeiner & Associates, 725 Nicholas building, Toledo, O., engineers.

Illinois

CHICAGO—Commonwealth Edison Co. has taken out permit to build new 4-story indoor type power substation and switch house; will proceed with superstructure at once. Cost about $500,000 with transformers, switch gear, auxiliary equipment.

MATTOON, ILL.—Coles-Moultrie electric co-operative, John G. Waggoner, superintendent, has $220,000 REA grant for construction of 215 miles rural transmission line in six counties.

WAUKEGAN, ILL. — Johnson Motors, manufacturer of outboard motors, has awarded contract to Campbell-Laurie-Lautermich Co., 400 West Madison street, Chicago, for construction of 2-story factory addition to provide 50,000 square feet of additional manufacturing space.

MOLINE, ILL.—John Deere Wagon Works has awarded contract to Axel Carlson Co. for construction of 1-story forge shop, 100 x 125 feet. C A. Eckerman, 1325 Third avenue, is company architect.

Louisiana

LAFAYETTE, LA.—Evangeline Packing

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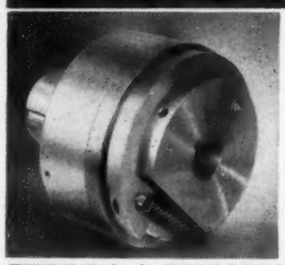

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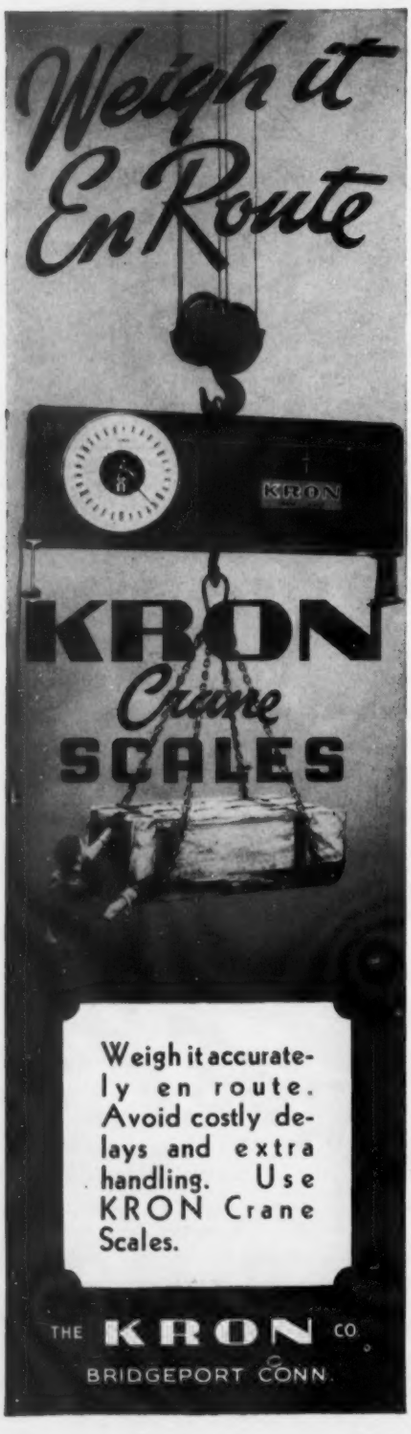
Co., Tohtz & Schloemann, St. Louis, architects, receives bids Oct. 17 for construction of packing plant, on general contract. Alternate bids will be asked for building, equipment, refrigeration.

Virginia

RICHMOND, VA. — Henrico county board of supervisors, county court house, receives bids Oct. 4 for sanitary district number one sewage treatment plant construction; Malcolm Pirnie, 25 West Forty-third street, New York, engineer. Estimated cost, $125,000; PWA docket, Va. 1337-F.

Missouri

KANSAS CITY, MO.—American Com-



pressed Steel Inc., 1300 Woodrow, Cincinnati, has acquired 2½ acres river front tract in Woodswether district for establishment of plant to convert light scrap steel into form that can be used by steel furnaces; to invest $125,000 in plant and equipment.

Arkansas

ARKADELPHIA, ARK.—Caple Handle Co. has leased site for erection of mill.

FT. SMITH, ARK.—Seedhouse, linters warehouse, Cherokee Cotton Oil Co. plant burned. Loss to buildings and equipment, $75,000.

MOUNTAIN HOME, ARK.—North Arkansas Electric Co-operative Inc. starts work soon on 185 miles rural transmission line in Fulton, Sharp, Izard, Baxter counties.

Oklahoma

CHICKASHA, OKLA.—Carroll refrigeration plant, under construction, was damaged by fire.

Wisconsin

CUDAHY, WIS.—Ladish Drop Forge Co. erecting addition to plant, 185 x 195 feet, to house heat treating department, machine shop; cost of building and equipment, about $75,000.

EAU CLAIRE, WIS.—Gillette Rubber Co. has awarded contract for construction of 2-story, V-shaped factory addition, 50 x 165 feet, and for improvement to boiler plant building, to Hoeppner-Bartlette Co.

MERRILL, WIS. — Strassheim Wood Products Co. plans 3-story factory, 61 x 100 feet. John Topzant, 424 East Wells street, Milwaukee, architect.

MILWAUKEE — Sivyer Steel Castings Co. plans erection of new building to house core room, stainless steel operations; to cost $50,000, 120 x 60 feet. L. S. Peregoy, president.

MILWAUKEE—F. R. Dengel Co., 1134 North Fourth street, plans erection of 2-story office, showroom, warehouse building, 100 x 150 feet, to cost $120,000. George Schley & Sons, Milwaukee, architects.

OAKDALE, WIS. — Oakdale Co-operative Electrical association, Lloyd McCaskey, superintendent, has been granted $161,000 REA fund for construction of 164 miles rural transmission line in Monroe, Juneau, Jackson, Sauk counties.

RACINE, WIS.—George Gorton Machine Co. has awarded contract for 1-story factory addition, 60 x 200 feet, to Johnson & Henrickson. Albert Kahn, Detroit, architect.

RACINE, WIS.—City has awarded contract to O. C. Christensen Co. for construction of 1-story municipal garage and machine shop, 40 x 160 feet and 60 x 100 feet respectively. H. A. Nelson is commissioner of public works, Frank J. Hoffman, architect.

SUN PRAIRIE, WIS.—Wisconsin Porcelain Co. has awarded general contract to Stegerwald Lumber & Contracting Co. for 1-story factory building, 80 x 214 feet.

WAUKESHA, WIS.—Waukesha Foundry Co. has awarded contract for 1-story machine shop, foundry, office building, 80 x 130 feet. Mark F. Pfaller, Wauwatosa, Wis., architect.

WAUSAU, WIS.—Wausau Brewing Co. has awarded general contract to W. M. Murphy & Son, New York Life building, St. Paul, for 1-story addition to bottling plant, 70 x 40 feet; will install new machinery and equipment. Oppenhamer & Obel, architects.

Minnesota

DULUTH—City, C. D. Jeronimus, clerk, is taking bids to Oct. 10, 11 a.m., on sewage treatment building construction, to cost $450,000. Bids will be taken on following: section M, general; section N, sewage equipment; section O, vacuum filters; section P, incineration equipment; section Q, heating, ventilating, plumbing; section R, electrical equipment. Plans are obtainable from clerk or Burlingame, Hitchcock & Estabrook, 419 Lyceum building, Duluth, consulting engineers. Certified check 10 per cent to accompany bid.

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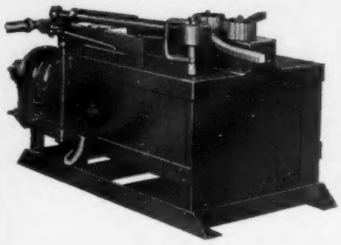

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valley light and power co-operative, Oscar W. Swanson, superintendent, has been granted $110,000 REA allotment to finance 118 miles rural transmission line in Lac Qui Parle, Chippewa, Swift counties.

MONTROSE, MINN. — Village, T. A. Thoreson, clerk, is seeking WPA aid in financing water works construction; surveys being made. Druar & Milinowski, 830 Globe building, St. Paul, consulting engineers.

ST. PAUL—St. Thomas college, Rev. James H. Moynihan, president, has awarded contract to Dunnigan Construction Co. for erection of 2-story boiler plant, 52 x 108 feet, to cost about $150,000. Ellerbe & Co., First National Bank building, engineers and architects.

St. LOUIS PARK, MINN.—Prest-O-Lite Co. Inc., acetylene manufacturer, has awarded contract to R. J. Keehn Construction Co., 608 Corn Exchange building, Minneapolis, for construction of 1-story factory in St. Louis Park, a suburb of Minneapolis. Jack Williams, 422 Washington avenue North, Minneapolis, is district manager.

TYLER, MINN.—Lyons-Lincoln Electric Co-operative Inc. has been allotted $239,000 REA fund for construction of 246 miles rural transmission line in Lincoln, Lyon counties. H. S. Bliss, Brainerd, Minn., consulting engineer. (Noted July 24.)

Texas

BEAUMONT, TEX.—Southwestern Bell Telephone Co., N. A. West, district manager, will install $42,500 equipment, including switchboard.

BRYAN, TEX.—City, W. W. Scott, acting manager, has voted $100,000 bonds for sewage disposal plant construction.

HOUSTON, TEX. — Fire damage to Brochstein Inc., store and office fixture factory, 3400 Washington street, about $100,000.

NEW BRAUNFELS, TEX.—City, Walter Sippel, mayor, has $63,926 WPA grant for improvements, extension to sewerage system. R. S. Jahn, city engineer.

TEXAS CITY, TEX.—Republic Oil Refining Co. plans new steam-electric power plant at local oil refinery, with installation of turbogenerator unit and accessories, boilers and auxiliary equipment. Cost estimated at $250,000. Company will also install motors and controls, compressors, conveyors, other equipment in connection with expansion and improvement in refining plant. Cost estimated at $1,000,000 exclusive of power plant noted. Proposed to begin work soon.

WINNSBORO, TEX.—City, R. H. McCrary, mayor, plans waterworks and sewer system. Albert C Moore & Co., 2404 Smith-Young Tower, San Antonio, Tex., consulting engineers.

Kansas

AGRA, KANS.—City, Dr. F. Lee, mayor, preparing plans, will soon file application with WPA for aid in complete new waterworks system, including well, distribution lines, 50,000 gallon tank on steel tower. Estimated cost, $58,000. Paulette & Wilson, 311 Farmers Union building, Salina, Kans., consulting enneers.

CLAY CENTER, KANS.—C & W. rural electric association, Irvin H. Smith, superintendent, has secured $77,000 REA fund for 89 miles rural transmission line in Riley, Washington, Clay counties. Raymond Reed, Abilene, Kans., consulting engineer.

HORTON, KANS.—Atchison electric co-operative, E. E. Dorssom, superintendent, has been awarded $78,000 to finance 95 miles rural transmission line in Jackson, Atchison, Brown counties. Midwestern Engineering Co., 326 Union State Bank building, Omaha, Nebr., consulting engineer.

North Dakota

VERENDRYE, N. DAK.—REA has allotted $90,000 to Verendrye electric co-operative for 65 miles rural transmission line in McHenry, Ward counties. H. H. Blackstead, president.

South Dakota

CLARK, S. DAK.—Clark county, L. G. Larson, highway superintendent, has started construction of 1-story county highway machine shop, 50 x 100 feet, as WPA project. F. C. W. Kuehn, Huron, S. Dak., architect.

Nebraska

LEXINGTON, NEBR.—Dawson county rural public power district will take bids soon on 272 miles rural transmission line in Lincoln, Gosper, Buffalo counties. Raymond Reed, Abilene, Kans., consulting engineer.

TECUMSEH, NEBR.—Eastern Nebraska public power district, D. H. Gustafson, president, is taking bids to 10 a.m., Oct. 12, on 246 miles rural transmission line in Richardson, Pawnee counties. Plans obtainable from District, or consulting engineer, H. H. Henningson, 1904 Farnam street, Omaha, Nebr. Certified check 5 per cent to accompany bid.

Iowa

BREDA, IOWA — WPA has approved project for sewage disposal plant, sewer system to cost $24,090. (Noted Sept. 4)

McGREGOR, IOWA — Village, W. R. Stone, clerk, will hold special election Oct. 12 to vote on bonds for construction of municipal light and power plant to cost about $125,000. Stanley Engineering Co., Muscatine, Iowa, engineer. (Noted July 24.)

NEW LONDON, IOWA—Village, Ora Williams, clerk, will take bids until Oct. 18 on improvements and equipment for municipal light and power plant, including power plant addition, coal handling equipment, piping and feed water equipment. Stanley Engineering Co., Muscatine, Iowa, engineer. (Noted July 31.)

THOMPSON, IOWA—Winnebago rural electric co-operative has been allotted $110,000 REA fund for 114 miles rural transmission line in Worth county. C. M. Palmer, president.

Colorado

LOVELAND, COLO.—City is completing preliminary plans for sewage disposal plant to cost $135,000; to be WPA project.

NORWOOD, COLO.—San Miguel power association, Wilton T. Hutt, president, has recommended all bids recently received on 116 miles rural transmission line in San Miguel, Montrose counties be rejected, new bids taken. Glenn R. Fickel, 518 Temple Court building, Denver, consulting engineer.

Idaho

SANDPOINT, IDAHO—Northern Idaho Rural Electrical Rehabilitation Association Inc., Glen A. Smothers, superintendent, has been granted $196,000 REA fund; $46,000 for 28 miles rural transmission line, $150,000 for construction of generating plant.

Pacific Coast

LOS ANGELES—City water and power department preparing plans for warehouse addition to cost $50,000.

BELLINGHAM, WASH.—Puget Sound Pulp & Timber Co. plans construction of filtration plant addition.

TACOMA, WASH. — City has $67,000 available for proposed power substation construction at Ft. Lewis. Award has been placed with Woodworth & Cornell, Tacoma, for construction of pumping station, reservoir.

VANCOUVER, WASH.—A. E. Stebinger, president, Stebo Inc., announces plans for construction of $200,000 plant, including saw and planing mills, modernly equipped, all electrically driven.

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READER Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

Our Place Is Here

To the Editor:

Everyone attending the recent conference of National Industrial Advertisers' association in New York (STEEL, Sept. 25, p. 31) must have voiced a hearty *amen* when Keynoter John A. Zellers declared, "This hemisphere is our place and here is our destiny."

I feel his statement reveals the course we must steer to survive the troubled times ahead. Regardless of what policy we ultimately adopt to protect our neutrality, it seems to me that in light of world conditions our protection will be incomplete until we launch a program of close co-operation with our Central and South American "good neighbors."

Unquestionably this hemisphere is peaceful democracy's last stronghold. It can remain so in the long run only if the 21 American republics, welded together by intimate political and commercial relations, present a united front in "hemisphere defense."

A good start has been made by the Inter-American conference in Panama, with its plans for increased trade between the nations and a jointly-patrolled "security zone" to keep the war 300 miles from continental shores. Undersecretary of State Sumner Welles promised delegates the United States will: Continue to augment its inter-American shipping facilities; enlarge its trade; aid the other nations financially in stabilizing their currencies; provide Export-Import bank loans for other purposes.

Business has a golden opportunity in Central and South America of which our own firm intends to take full advantage. Trade diverted from the warring powers alone will be considerable. Moreover, the Americas promise to become more substantial markets for manufactured products if investment funds can be interested in their vast undeveloped natural resources.

It must be kept in mind these nations will be able to buy comparatively little unless we are willing to extend credit and provide development capital. We must accept some of their products. If we are ready to do this we can establish an intercontinental American economy and profitable trading area.

EXPORT SALES MANAGER

New York

One Blessing from War

To the Editor:

American industries are finding the European situation a not unmixed blessing. Even though we do not increase our exports to the allied belligerents, we shall benefit materially through development of more cordial relations with the other American republics.

American business has complained for years that normal increase in export trade with South and Central American nations has been impossible due to sharp competition from Germany, Italy and Japan.

South American market penetration by totalitarian industries had progressed farther than was commonly realized here. Until Secretary Hull started working for closer inter-relationship between us, little concerted effort was made to combat the rise of trade with European nations and Japan.

Volume of trade with this country has already increased materially, promises to grow steadily. With the Inter-American conference showing our southern neighbors more clearly than ever the future of both continents is closely interwoven, and with a wisely discriminating trade policy on our part, it is possible to cement our bonds closely.

MANUFACTURER

Cleveland

Mechanized Farming

To the Editor:

In a late issue of STEEL your editorial briefly discusses advantages of mechanized farming over draft-animal methods. While it is indubitably true development of the tractor has been a contributing factor to decline in price of certain farm products, a thorough analysis of the problem reveals that farm prosperity depends upon efficient exploitation of natural resources.

Science and industry are making continually greater demands upon the farmer for products other than those required for mere subsistence. Within the past decade the soy bean product and tung oil industries have grown from negligible factors to a dominant position.

Successful farmers are those who employ in their business the same principles used by great industries. More production of better quality products at less cost is essential to profit making. The role machinery plays in this scheme is incalculable. With increasing development of tractors and other implements to meet demands of every farmer, whether he cultivates 5 or 500 acres, an era of rural prosperity is in sight.

FABRICATOR

Chicago

FOR THE *Shop* OR THE *Road*

In the shop, ARMCO *H.T.-50 saves time and money. Here its excellent welding properties assure dense, uniform welds with standard electrodes. And despite great strength, its ductility closely approaches that of mild steel.*

School bus transportation must be safe and sure. Travel over rutty, chuck-holed back roads presents a real problem in metal fatigue—the kind of a problem that the high endurance limit of ARMCO *H.T.-50 can solve readily.*

HERE'S A WISE HIGH-TENSILE CHOICE

Transportation equipment specifications are getting more rigid every year. One state has a new school bus regulation which says in effect: "Body tops must be strong enough to support the weight of the entire bus without crushing." The purpose is apparent.

Meeting this sort of requirement often means a difficult problem of manufacture. Yet it's a made-to-order job for ARMCO H.T.-50. With a minimum yield point of 50,000 lbs. per square inch, this improved high tensile steel permits compact, light-weight designs with ample strength for indicated rigidity and safety. And with its fatigue limit of 48,000 lbs. per square inch, there's less danger of structural failure from vibration. And ARMCO H.T.-50 offers atmospheric corrosion resistance 4 to 6 times that of mild steel.

You also are assured of great ease of working; dense, uniform welds with standard electrodes; a clean, smooth surface for good paint adherence; desirable flatness and uniformity in shipment after shipment.

Write us for the rest of the interesting ARMCO H. T.-50 story. The American Rolling Mill Company, 1510 Curtis Street, Middletown, Ohio.

Visit Armco's booth, E-101 at National Metal Congress, International Amphitheatre, Chicago, Oct. 23-27.

ARMCO

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